CRYPTOLOGIC QUARTERLY

❚ NSA's 50-Year Path to Transparency

❚ Women Codebreakers of World War II

❚ The History of Classification at NSA

Cover: Executive orders have addressed national security classification for decades. *Top,* President Harry Truman in the Oval Office in 1949, displaying the National Security Act Amendments of 1949, which he has just signed. Two years later, he signed Executive Order 10290, which established standards for classification of information related to US security. (National Archives and Records Administration 200169, Abbie Rowe photographer.)

Bottom, President Barack Obama signing an executive order in the Oval Office in 2009, the year he signed Executive Order 13526, "Classified National Security Information." (Official White House photo by Pete Souza.)

Read the full story in "Pulling Back the Curtain: NSA's 50-Year Path to Transparency" on page 53.

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Plus: A Milestone in Women's History

Nancy Welker

The years 2020-2021 were ones to remember—or perhaps to forget. We were all concerned with masks, social distancing, and the health of family and friends as well as of ourselves. We longed for the development of effective vaccines and therapeutics that would free us from all of this. Thus, we may have been less conscious of important historical events that would have been celebrated with greater fanfare than was possible virtually. One such commemoration was the 100th anniversary of the ratification of the Nineteenth Amendment to the US Constitution giving women the right to vote. This amendment was the result of a decades-long effort by figures like Susan B. Anthony and Lucy Stone as well as hundreds of lesser-known advocates. The turning point may have been the Seneca Falls Convention led by Elizabeth Cady Stanton and Lucretia Mott in 1848, but there was much work to be done following that. The Nineteenth Amendment was finally proposed to Congress and passed in June 1919 and ratified by the required 36th state (Tennessee) on August 18, 1920.

From our current perch in the twenty-first century, we tend to think of the struggles of the suffragists in the nineteenth and early twentieth centuries as something from the dim, dark past.

In fact, the ratification of the Nineteenth Amendment did not magically cause all the inequities to disappear. From the current national security world, we can see examples of this. A History Today article by NSA Historian David Hatch (September 14, 2021) pointed out that "In late 1971, the Army Security Agency (ASA) received authority to enlist women in all operational and specialty areas, not just the traditional administrative and clerical jobs they had previously held."

In keeping with this theme, this issue of the *Cryptologic Quarterly* contains two articles that address women who did not allow obstacles to deter them from making critical contributions to the security of the nation. In the first article, "Researching Code Girls: Lessons from the Women Codebreakers of World War II," Liza Mundy, author of the best seller *Code Girls: The Untold Story of the American Women Code Breakers of World War II*, tells the story of the research required to unearth facts associated with the work of thousands of young women recruited in the early 1940s to support the nation during World War II. Before their arrival in Washington, DC, they did not know that this effort would be the breaking of German and Japanese codes. A fascinating aspect of Mundy's narrative is a description

of her difficulty finding and interviewing as many of these women as possible, most of whom were in their 90s. Even harder than finding them was convincing them, after all the security briefings they had been given, that it was now all right to talk about their work. They had taken the responsibility for maintaining the secrecy of their work very seriously indeed.

A second article deals with a pioneering woman, Evelyn Niemann Akeley, whose role was not to break codes but rather to teach others to do so. At the start of World War II, she was an assistant professor of mathematics at Skidmore College in New York state. With a sound foundation in mathematics but virtually no knowledge of cryptology, she designed an educational program for dealing with the most complex cryptologic systems. Many of the women mentioned in Mundy's book benefited from Akeley's teaching and mentorship.

The skills and determination of Akeley and the "code girls" would have made them successful in any case, but one has to believe that standing on the shoulders of the strong women who came before made their acceptance a bit easier.

Sarah Parsons's article "Pulling Back the Curtain: NSA's 50-Year Path to Transparency" describes the arduous journey from the NSA policy of classifying all documents as sensitive information that must be protected forever to the current mode of assessing documents and releasing all material that is not considered harmful to national security. The realization came slowly but clearly that the public would have more trust in an agency that told them—to the extent possible—what it had done on their behalf, how it had been done, and what the outcome was. The release of the VENONA documents is a perfect example. Fragmented bits of information about Soviet espionage activities after World War II had circulated for years. The VENONA documents clearly laid out exactly what had happened. Efforts like this brought a level of trust to the Intelligence Community that it had not previously enjoyed. One cannot help but think that Liza Mundy would have had an easier time convincing her subjects to recount their World War II efforts if this policy had been known to them.

This edition of the *Cryptologic Quarterly* also contains Jessica Garrett-Harsch's book review of *The US Navy's On-The-Roof Gang: Volume I—Prelude to War* by Matt Zullo. The book uses a solid, well-researched technical description of an actual navy collection activity and fictionalizes and humanizes it with made-up dialogue and insights from the author's past. The book focuses on Chief Radioman Harry "Pappy" Kidder, who was chosen to train the Morse code operators at multiple collection sites across the Pacific. In so doing, he raised those operators to the level of more often recognized codebreakers. The book title derives from the only classroom space available to Pappy Kidder, which was on the roof of the downtown Washington, DC, Navy Building.

We hope you enjoy these recountings of some of NSA's accomplishments as well as those of its predecessors in the cryptologic world. Patrick Bomgardner's article "Where Did They Come From? Why Classification Advisory Officers Are Unique to NSA" describes the origins of the concept of classification advisory officers and the complex path they travelled to arrive at the position they occupy at NSA today. They contributed to ensuring that the papers in this issue may indeed be shared widely—a key to NSA's commitment to transparency.

—Dr. Nancy Welker
Chair, *Cryptologic Quarterly* Advisory Board

Researching *Code Girls*: Lessons from the Women Codebreakers of World War II

Liza Mundy

Editor's note. The following article was adapted from a talk that award-winning journalist and author Liza Mundy presented to NSA information management professionals. As the NSA/CSS Scholar-in-Residence from September 2019 to September 2020, Mundy was also a featured speaker at the 2019 Cryptologic History Symposium. She had numerous other engagements with NSA's workforce throughout the year, including "town hall" meetings, panel discussions, and National Cryptologic School courses. She led a discussion on diversity and inclusion with faculty and students at the National Intelligence University, in part to honor the legacy of former NSA Deputy Director Ann Caracristi. Mundy's research continues to examine the impact of women and people of color who continued to work in American cryptology into the Cold War.

During this December 2019 presentation, Mundy described how she researched her best-selling book, *Code Girls*: *The Untold Story of the American Women Code Breakers of World War II*, and explained how work performed over the years by NSA archivists, declassification experts, and historians enabled her efforts. Because she came to know the women she interviewed multiple times, this article retains Mundy's use of their first names as in the original presentation.

Introduction

It's such an honor to be a scholar in residence, and I hope to use the year well. I've already had many useful meetings with historians in the Center for Cryptologic History (CCH) and learned even more about the declassification and history processes. Part of the purpose of the scholar-in-residence program, as I understand it, is to educate historians and authors about how best to avail themselves of the declassification process and the resources of CCH. What I'm going to do today is talk about how I researched and wrote *Code Girls* and explain how your efforts, preserving original records and making them available, enabled me to do this. I couldn't have done it without the work of CCH historians and the people who are declassifying historical material.

Here's an example of how important your efforts are to the preservation of US history. When an author seeks to get a nonfiction book published

by a commercial publisher, he or she comes up with an idea and does quite a bit of research and reporting, enough to write a proposal. That takes a while. Then, working with an agent, the author writes up what she hopes will be a persuasive, attractive proposal. The agent sends that proposal to a number of editors and publishers. The author then meets with those who express interest, to get to know the editors, while, in turn, the editors can decide whether to bid on the proposal. We went through this process with *Code Girls,* and a number of editors showed acute interest. This was before books like *Hidden Figures* [*Hidden Figures: The American Dream and the Untold Story of the Black Women Mathematicians Who Helped Win the Space Race* by Margo Lee Shetterly] had really put it on the map that we are in a new era of appreciating women's contributions to history—before editors fully understood just how wide the appetite is for these true, often untold stories about women, citizens of color, and other hitherto-unrecognized Americans who did pioneering work. Still, editors seemed very intrigued.

When you say, "World War II women code-breakers," that in and of itself is persuasive. One editor, who ultimately decided not to bid on the book, told my agent that he feared, however, that there wouldn't be enough research materials available to fill out a whole book on the topic. He said he thought perhaps the result would be "thin beer." Fortunately, other editors weren't skeptical: after a number of publishers bid on the proposal, I went with the publishing house Hachette, and they were so enthusiastic from the start and such great partners. When the book came out it had a thick bibliography and footnotes. Needless to say, I couldn't help but hope the "thin beer" editor took note of just how substantial the research had been.

Every reporter and researcher worries about whether he or she will be able to get enough information to write an article or book. I literally got up every morning haunted by that remark, thinking, "Well, you know, I'll show you thin beer." Up to a point, such anxiety is productive, and it propelled me to seek out all the archives and people I could find. But, if it had not been for the work that you all do making historical material available, the beer indeed might have been somewhat thin. In the end, if you look at the bibliography and footnotes, you'll see there was a copious amount of research material to be found. I thank all of you for working so hard to make these original documents available so that people can know these important stories of American history and the contributions that people in the Intelligence Community have made to our national security and to our freedom.

Origins of My Research Idea

It actually started, in a way, with Senator Daniel Patrick Moynihan, who was very interested in intelligence, openness, and history. There was controversy concerning Soviet World War II espionage activities and the US effort to decrypt Soviet World War II era messages after the war. That effort, known as VENONA, extracted information from decrypted Soviet intercepts to identify people who had spied for the Soviet Union during the war. There was controversy about the Rosenbergs and some peoples' names. Did they do it? Didn't they do it? Finally, as I understand it, Senator Moynihan sought the release of all the VENONA information so that scholars could take a look and arrive at informed conclusions.[1] As a result, a large, sort of blanket declassification of the VENONA materials occurred, including a history that an NSA historian, Lou Benson, had written about VENONA.[2] It's my understanding that parts of it are still classified, but the first section was declassified and was kind of floating around the Internet and brought to my attention. When Benson was researching VENONA history, one of the things that he noticed was

that the majority of cryptanalysts working on the VENONA project were women, and a surprising number were former schoolteachers. One, Gene Grabeel, came from southwestern Virginia, which is not far from where I grew up in Roanoke, Virginia.

The history mentioned some of the early people recruited to work on the VENONA project during the war. One of them, a military officer, Leonard Zubko, was surprised to find that Arlington Hall seemed to be staffed almost entirely by female civilians.[3] Benson, who was working on this history in the 1980s, did future historians an enormous service by conducting interviews with Gene Grabeel, Carrie Berry, and a number of the other women (most now no longer living) who'd spent their careers working on VENONA. He folded a lot of that material into the part of the history that was declassified, and I could see that these former schoolteachers from Texas and southwestern Virginia were suddenly presented with tangles of Soviet intercepts and asked to sort them out. That was so intriguing that I thought, "Well, maybe that could be a good magazine article, about this group of women coming to work on these Soviet intercepts."

I called the Public Affairs office at NSA, and they set me up with Betsy Smoot, a historian from the Center for Cryptologic History, and Jennifer Wilcox, a curator at the National Cryptologic Museum. I came up to meet them without really knowing anything about anything and just said, "So, can you tell me a little bit more about this group of women?" They spoke for about two hours, and laid out this much larger story of women being recruited during World War II to work mostly on German and Japanese codebreaking—especially Japanese message systems—as well as message systems from all over the world. They were using words I had never heard as a layperson, like MAGIC, Purple, ULTRA, and Enigma.[4] I was trying to absorb all of this information

and the enormousness of this story. In some ways, it was as if they had been waiting for somebody to come along who was interested in the women, and I was.

Driving back from the museum, I thought, "This is a really big story." I couldn't believe it hadn't already been told. I immediately thought it would be more than an article and could be a great book, a great narrative, even though I didn't know anything about cryptology, and my knowledge of World War II was limited. I'd been to some battlefields and had studied the war in college. The immediate question was: Would it be possible to find any of these women? They would be in their 90s. Would I be able to track them down? If I could get them to talk to me, would I be able to find the material necessary to substantiate their recollections? They would be talking about work done almost 75 years earlier. Obviously, you can't use that kind of material in a book unless you can substantiate it with the documentary record. That seemed like a tall order. But I was so intrigued that I communicated with Betsy Smoot afterwards, and she methodically did for me what she would have done for any US citizen who was interested in this story. She went back through her files to find families that had contacted CCH to say, "You know, I think my mom did some work during the war on codebreaking. Could you help me?" She had saved every one of those emails from maybe 15 or 20 families. She contacted them all to ask if it was okay if a researcher contacted them and put me in touch with the ones who said yes.

Early Interviews

In most of these cases, the women themselves were no longer alive; that's why their families were getting in touch with NSA. But in the case of a woman named Ruth Weston who was no longer alive, her family knew that her best friend during the war, Dot Braden Bruce, was living in an assisted living facility in the Richmond area.

They put me in touch with Dot's son, Jim Bruce, who agreed to try to persuade his mother to disclose the story, which she had never been willing to tell her family, about her wartime work. The kids, growing up, had read the letters that she and her future husband, also named Jim Bruce, had written each other during the war. The children knew their mom did something in Washington. Very late in life, she had started dropping hints that the "something" had to do with codebreaking. They didn't know whether to believe her.

Jim Bruce the son was very motivated to try to get his mother to finally spill the beans. We went together to Richmond in an effort to persuade her to talk. She had grown up in Lynchburg, Virginia, and attended Randolph-Macon Woman's College. She was teaching school in Chatham, Virginia, when war broke out and was completely swamped by the teaching load because the male teachers immediately signed up for the fighting if they were of fighting age.

A lot of people think reporters get their information by pounding on doors and being sort of aggressive in their tactics—like shouting questions at the president from the driveway of the White House—and sometimes that's true. But those of us whose research generally involves trying to coax stories out of people and earn their trust, don't work that way. I put on my nicest outfit, got flowers from a local florist in Arlington, and went down there to try to see if I could persuade her I was trustworthy. It helped enormously that her beloved son was present, and that we had the imprimatur of the NSA history office. We assured her, truthfully: "Yes, you signed this loyalty oath. Yes, you swore about secrecy. Yes, you were told you would be shot if you talked during the war. But the story has been declassified." Nobody had tracked these women down to tell them that the story had been declassified or when that declassification had occurred, so she really didn't know and thought she might still be shot. Jim and I

sat there for about half an hour trying to assure her it was okay to talk. She clearly wanted to talk about her contributions to winning World War II, but even as she was tempted, she was nervous. She had been afraid all during the war that she would bring a piece of paper home or let a term of art slip on the streets of Washington. People were really fearful during the war of letting something slip. They took seriously the warning that loose lips sink ships.

She kind of toyed with us for a while and then finally said, "Well, what are they going to do at my age, put me in prison?" I said, "Well, if they do, it will probably be a nice prison." She had a very good sense of humor, and that sort of put her at ease, along with having her son there. I think she really trusted Jim that this was okay.

And so Dot Braden finally started talking. She unspooled this remarkable story of being a schoolteacher in Chatham, Virginia, coming home for the summer, and telling her mother, "Mom, I'm so exhausted. I can't go back to school-teaching. What else could I do?" War had broken out and her brothers were now in the army. Her mom said, "Well, there's an army officer recruiting at the Virginian Hotel in Lynchburg." Dot walked through the door, signed up, and applied for a job. She didn't know what it was. She knew it was secret. She remembered taking the train for the first time in her life and arriving in Union Station in Washington, DC. "With my two suitcases, my umbrella and my raincoat, I went down to the train and my uncle had to take me down there … no car. And my mother and her sister were standing there crying when I got on the train. I was very secure that everything was going to be just fine—Washington would greet me with open arms." Her welcome to Washington in reality entailed being told they didn't have a place for her to stay, and she'd be shot if she told anybody what she was doing.

Braden took a cab to someplace in Virginia

called Arlington Hall. She remembered barbed wire, military officers walking around looking intimidating, and other scattered details such as the young woman who administered the loyalty and secrecy oaths. She started talking about the Japanese messages; they had to do with ships. She remembered there were numbers on them. We kept trying to get her to describe what the messages looked like physically. She used a phrase, the word *overlap* or *overlapper*, which she had never uttered outside the confines of Arlington Hall. She clapped her hand to her mouth because she couldn't believe she had spoken it aloud.

I spent several hours with her—listening to her recollections, getting it down, recording it—and then left, knowing I would go back and back and back. "Okay, she's told me this story," I was thinking. "She's a great raconteur. It could be a tall tale." Probably not a tall tale, but how was I going to substantiate what she had said?

I started working on that problem while also trying to find other women. Betsy Smoot put me in touch with Ann Caracristi, who was, I'm sure you know, the first woman to serve as deputy director of NSA. She had indicated she would be willing to talk to me but was quite infirm. I called her. I left a message. Then wrote a letter—but didn't hear back. But I knew she had said she'd be willing to meet. At a certain point I again did what reporters are trained to do: I put on my Sunday best and went to her house in Georgetown. I knocked on the door, and, I'll never forget, Ann Caracristi opened the door on a Sunday. She was wearing a suit. She was listening to opera. She invited me in, and she started talking.

Early Research

At that point, I had interviewed two women but needed to obtain archival records to substantiate what they were saying. I started spending time at the National Archives in College Park, Maryland, mining this enormous set of declassi-fied records that tell the story of World War II codebreaking, but in a very disorganized format. It's wonderful that the records are there, and there is, of course, a finding aid.[5] But in the end, my sense of Record Collection 457 [where records related to NSA and its precursor organizations are stored] is that after the war, somebody came in, swept all the papers off the desks, and put them in storage for 50 years. Then, when that mass declassification process began in the 1980s, the records were put in gray boxes. I would sit with box after box. I would go through the finding aid and try to target some boxes, but in the end it was such a mass of materials. Waterlogged code books. Rosters. You really never knew what you were going to get when you opened a box. It took months of patient work, but I was an English major and love reading and the archival work. Digital records are great also, but if you don't get the right key word, you might miss a critical piece. Sitting and leafing through paper records, you can also find stuff you didn't expect. I love paper and was very happy to just sit there and read. Every gray box was like a Christmas present. "Wow, what's going to be in here?" I love digital resources—and you can do a lot of work online, from home in your pajamas—but there's no substitute for having the paper record. I thought I would spend a week or two at the National Archives. Instead, I was there month after month, every day, going through the records, really trying to read carefully.

One day I was there, it was after lunch, and I was pretty tired. Going through records, I came upon rosters of women who had gone through orientation at Arlington Hall in 1943, just weekly records of names. There's something very evocative about seeing list after list of women's names. It gives you a sense of the number of women who were coming to Washington. I was blearily reading this very faint page and saw "WESTON, Ruth" and thought, "Wait, that's a familiar name." Ruth Weston, the codebreaker whose family had

put me in touch with Dot Braden, went by the name Carolyn when she was in Washington. Her name was Carolyn Ruth Weston, initials CRW. Dot called her by the nickname "Crow." So I had the four names in my head just for her, and as I saw it, I thought, "Ruth Weston, wait, no, oh, wow, that's Crow." I looked over on the other side of the page and saw Dorothy Braden's name. That was my first confirmation that Dot Braden had done this work, that yes, she had been a code-breaker in Washington! The things she'd said, at least some of them, were likely true.

Anybody who's done archival research recognizes the moment when you want to stand up and tell everybody in the room about what you have just found and how important it is. Of course, when you're in the research room of the National Archives, you can't do that. I immediately took a photo of the page, emailed it to her son Jim, and said, "I found your mother's name in the National Archives." He emailed me right back and said, "Oh, my gosh, she wasn't lying!"

The roster provided more than just a list of names. It gave me the date that Dot Braden received her orientation at Arlington Hall. There were more pages attached to this document that indicated when she was run through the in-boarding process. It was almost Christmas. There were some Christmas celebrations. William Friedman, the pioneering American cryptologist, came in to spread holiday cheer and say hello to the new recruits. The roster also revealed that she was assigned to Department K—a really significant detail.

The roster gives you a sense of how many women were coming through each week. I loved the names of the women from the 1940s: Effie, Bertha, Myrtle, Mildred, Erma. Names you don't hear that much anymore. One of the funny anecdotes related by Lou Benson was that there were women from the South, the North, and other parts of the country coming together, and one

of the male cryptanalysts referred to the Southern women as the "jewels," because he thought a lot of the women from the South had names like Ruby, Opal, and Pearl.[6] When I went through some of these rosters, I found that there were in fact Rubys and Opals and Pearls and Emeralds, and there were even a couple of Jewels.

Another document in all of these gray boxes explained what Department K did and who the supervisor was. It indicated the people in Department K were working the four-digit Japanese Army Water Transport Code, an important shipping code the Japanese Army was using for the ships that were supplying its troops all over the Pacific. According to David Kahn, the three most important codebreaking operations during World War II were, number one, the breaking of the Japanese Naval Fleet Code that led to victory in the Battle of Midway and many other signal events.[7] The second was the breaking of the German Enigma cipher that gave us the ULTRA information. The third was the breaking of the water transport code at Arlington Hall. Every day, the water transport code provided American submarine commanders with information regarding the whereabouts of Japanese supply ships and enabled these commanders to sink ship after ship after ship. Two-hundred-seventeen people, mostly women, worked on the system, which they referred to as 2468. By looking at documents in the National Archives that had been declassified by archivists and officials like you, I was able to confirm ultimately everything Dot remembered. It was exciting to do this research!

Dot recalled running from station to station and working as fast as she could. Sure enough, a document commended her unit for increasing production, with a continuing decrease in the time necessary for solution. It commended the schoolteachers for getting faster and faster and faster at the work they had to do, exactly as Dot remembered.

I was also able to obtain Dot's civilian personnel record from the National Archives in St. Louis, MO, which has the personnel records from World War II.[8] That was very moving because the file contained her application in Lynchburg, Virginia; her medical exam; and her college record from Randolph-Macon. It also had testimonials, taken by FBI officers doing background checks on all of these women. Growing up during the Depression, Dot was the oldest child of a single mother who couldn't afford the tuition at Randolph-Macon, so she attended on a scholarship and worked her way through. Her college professors described her as personifying "all that is good in college life." They talked about her financial straits and what she had overcome to get her degree. Dot had never seen these documents; she didn't even know they existed. I was able to read to her what her college professors had said about her almost 75 years earlier. However, those records wouldn't have been enough to tell me what she had been assigned to do. For that, I needed to visit a number of government and private archives.

The Women Move to 1940s Washington

At the Library of Congress, I was able to get photos of Union Station in 1943. In one Gordon Parks photo you can see the war propaganda on display at Union Station, such as a huge banner depicting heroic Allied soldiers, which confirmed one of Dot's memories.[9]

Esther Bubley, another photographer hired by the government, created evocative and surprisingly intimate photos of boardinghouse life in Washington (including photos of the women writing to soldiers and receiving letters back) as the government girls, or "g-girls," were pouring into the city.[10] Many young women rented rooms at a place called Arlington Farms, which is where Dot Braden stayed when she first came to Washington. When Dot arrived in Washington, she fully expected the army would provide her with free housing. But upon checking in at Arlington Hall, she was told, "No, you're going to have to go to this civilian place and rent a room. You need to have money in advance," as she put it. So she had to wire her mom for the funds. I was able to confirm what Arlington Farms Duration Residence Halls likely looked like when Dot was there, thanks to photos of rooms where the young women lived. Dot remembered taking the bus to Arlington Hall, and sure enough, there were photos of women waiting for the bus. The *Arlington Historical Magazine* had an article about Arlington Farms that contained a really good description of their lives and work. The article was titled "Twenty-eight Acres of Girls," a local nickname for the place at the time.

Dot also had kept her personal correspondence. Many women were writing to soldiers; Dot, like plenty of her colleagues, was actually writing to more than one. She seemed to me to be a little more reluctant to have that go into the book than the fact of her secret codebreaking! One of her admirers addressed his letter to her initial residence at Idaho Hall, which was one of the dormitories at Arlington Farms (all of which were named after US states). She also kept a handwritten message confirming that Jim Bruce, the man she would ultimately marry, came to visit her right before he shipped out to go overseas. She remembered getting a phone call in the codebreaking office, which was unusual; he said he was coming to town because he wanted to see her before he left. She still had the note that somebody had given her at Arlington Hall, saying Lieutenant Bruce was coming to Washington that afternoon, before beginning his service as a meteorologist keeping Allied airmen safe.

A lot of the three-story garden apartments that can still be seen in Arlington, Virginia, were built to house these wartime women workers. Dot Braden and Ruth Weston eventually left

Arlington Farms and moved in as roommates in one of these buildings. The apartment is still there at Fillmore Garden Apartments in south Arlington. The address appears on the letters that Jim and her brothers wrote her. In one letter, Jim complained that "Dearest Dot, I have no letter of yours to reply to since I haven't heard from you since I wrote last." In fact, while she was writing him regularly, her letters were sometimes delayed and would arrive in clumps as they passed through the Army Post Office (APO) system. All their correspondence was wonderful to read.

Before the war, Dot Braden had become somewhat reluctantly engaged to her college boyfriend. This other fellow had sent her a ring in the mail and she was afraid to send it back, because young women were told not to upset the troops. But she was looking for a way out, and one reason she took the codebreaking work was because it provided a highly valid excuse not to get married to this guy. She did manage to disentangle herself, eventually, and over the course of two years—purely through correspondence— became engaged to Jim Bruce. The marriage was a happy one indeed. One of the things I enjoy telling younger audiences is that there is nothing new under the sun. The women, who often included photos along with their letters, were sending the equivalent of selfies to the men overseas.

In another photo of Dot, you can see her with Ruth Weston at the beach smiling at the camera. This was one of the photos Dot sent to Jim. The women didn't have a lot of spare time between their codebreaking work, but they managed to make the most of it when they did. I was so grateful to Dot for saving the letters and the photos that she'd sent.

One group of enlisted women who left the work after the war, as most of the women did, maintained a friendship group. For 75 years, they wrote a group "round robin" letter to each other, which continued until their deaths. By the time I was doing my interviewing, there were two women still alive. One of these, Ruth Mirsky, used "Ruth the Wave" as her email address. Even though she couldn't talk about the work she'd done, her identity as a WAVE (Women Accepted for Volunteer Emergency Service, a division of the US Navy) and her codebreaking work remained that important to her identity and sense of self.

Working at Arlington Hall

There are numerous photos of Arlington Hall, where the army's codebreaking operation happened, as well as declassified photos of the temporary buildings where the women worked. The helpful archivists and librarians with the Arlington Public Library collection also located a master's thesis on Arlington Hall that provided the history of the land and the school. A junior college for girls, the facility was taken over by the army in 1942, when the US Army was seeking a large, secure, somewhat off-the-beaten-path location for top secret codebreaking work.

There are also many declassified photos of the women engaged in various stages of the codebreaking process. Photos show rooms of former schoolteachers learning about the geography of Asia and receiving teletypes from the Pacific. Researchers can get a visual sense of their work setup thanks to these declassified photos, many of which were at the National Archives and some of which are online now. Dot Braden remembered working at a table with a lot of other women. She remembered a pole; and that when she had a message that was urgent, she would jump up and almost hit her head on the pole. And sure enough, poles are visible in some of the photos. She remembered hand-carrying the message to the overlapper station, where the overlapper would literally put messages—as I understand it—sort of vertically on a board. They were trying to match numerical code groups to look for patterns, names of ships and things like that, after

Arlington Hall main building, May 15, 1946, in Arlington, VA. The former girls' school became the US Army's cryptologic headquarters at the beginning of World War II. National Archives College Park, MD

Buildings A and B at the Arlington Hall campus, March 11, 1947, where women codebreakers worked. More than 7,000 personnel worked at the campus. National Archives College Park, MD

Dorothy Braden in 1942 when she was a schoolteacher, before becoming a codebreaker

National Archives collection card and Arlington Hall orientation roster from 1943 confirming that both Dorothy Braden—a key source for the *Code Girls* book—and Ruth Weston were trained there. National Archives College Park, MD
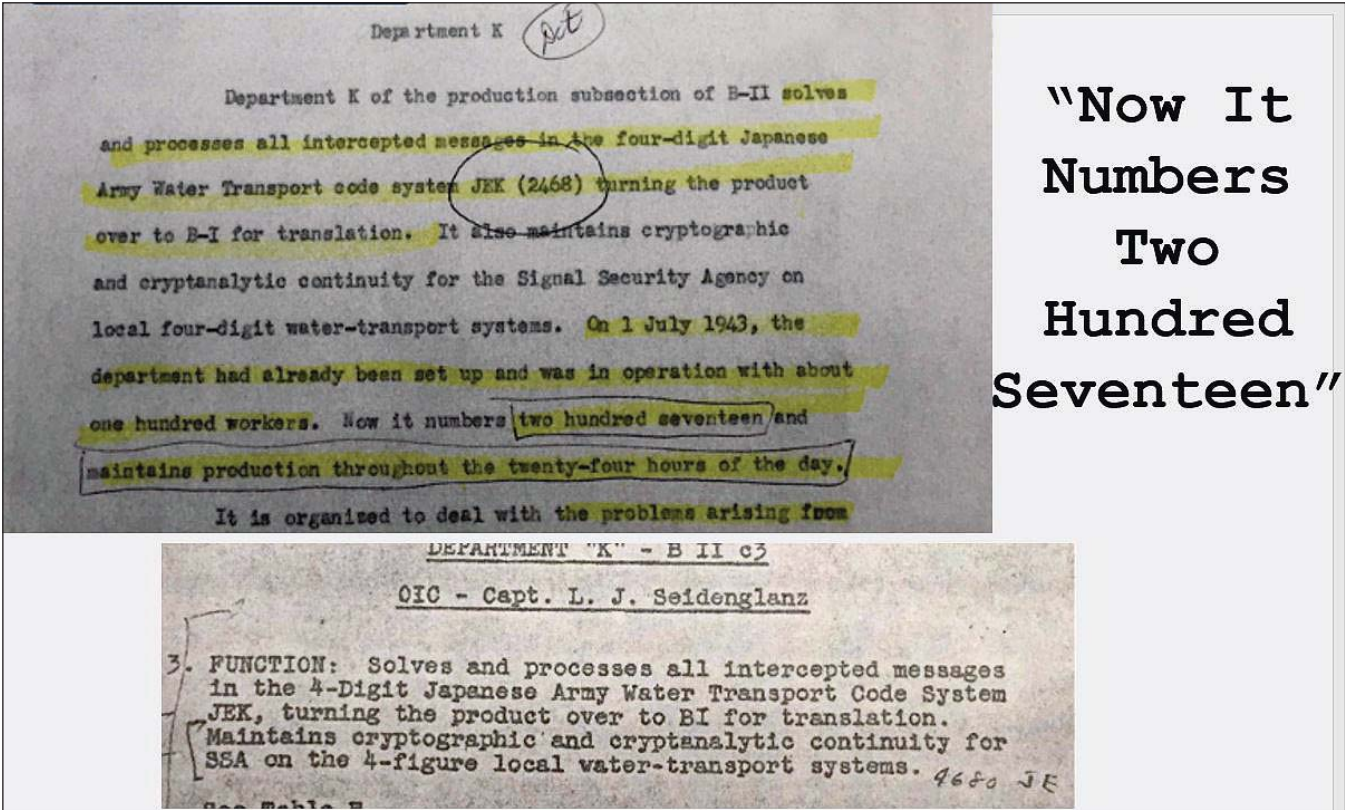
Slide from Liza Mundy's presentation showing National Archives documents describing Department K at Arlington Hall, where women cryptologists broke the four-digit water transport code that the Japanese Army used for its Pacific Ocean supply ships

Codesheet showing decryption of the five-digit Japanese Naval Fleet code, March 5, 1944. National Archives College Park, MD

WAVES, or Women Accepted for Volunteer Emergency Service, a division of the US Navy created during World War II, at work codebreaking. National Archives College Park, MD

B Branch (B-II-F-3) cryptologists working in Arlington Hall, September 1, 1945. National Archives College Park, MD

Future NSA Deputy Director Ann Caracristi (right) working in the Hona Subsection B-II-d-3, Arlington Hall, September 1, 1945. Liza Mundy interviewed Caracristi in her home in Washington, DC. National Archives College Park, MD

WAVES, or Women Accepted for Volunteer Emergency Service, a division of the US Navy created during World War II, crossing Nebraska Avenue in Washington, DC, from barracks to work. National Archives College Park, MD

Slide from Liza Mundy's presentation showing navy document on training, fall-winter 1941. As men were shipping out for military duty overseas, a new source of cryptanalysts was needed. National Archives College Park, MD
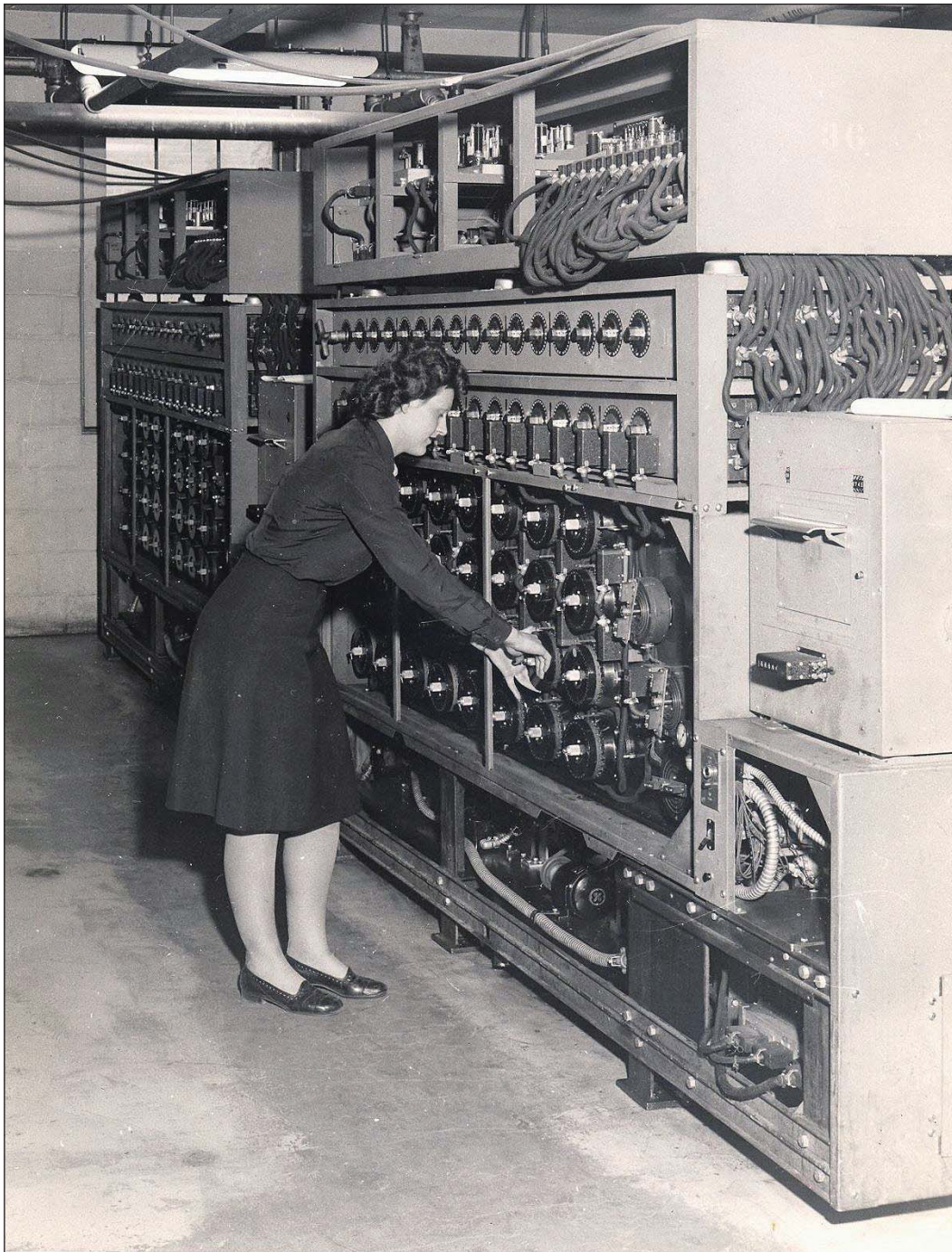
N-530 BOMBE
SECOND DECK   BUILDING 4
MAY 25, 1945

A WAVE operating a *bombe*, May 25, 1945. National Archives College Park, MD

Reunion of Arlington Hall codebreakers, including Ruth Mirsky (front row, second from right), n.d. Right: Packet of some their correspondence over 75 years following the war.

they had subtracted out an additive. It basically was a big assembly line.

Dot remembered one overlapper in particular, who came from New York City and (she recalled a little resentfully) would make fun of Dot's southern accent, over lunch. Arlington Hall was, after all, a government workplace, and while the work was vital and urgent, doing that work day after day (and night after night) still meant toiling in an office alongside other people—many, many other people.

One of the most entertaining documents that Betsy Smoot directed me to in the National Archives was something called a morale survey. In the summer of 1943, the higher-ups realized that morale in these massive rooms wasn't what they'd hoped it would be. It was incredibly hot, there were fans everywhere. They were giving the women salt tablets that were supposed to alleviate sweating but (as Ann Caracristi recalled) made some women sick and caused them to faint. Leadership went around and spent time with a lot of the workers at Arlington Hall and invited office workers to complain. The complaints were vivid and, even today, familiar to any office or cubicle worker: for example, people were snapping gum, they were smoking on the job, they were gossiping, they weren't working as hard as they should, they were chit-chatting. There were people who loved the work, but there were just the usual complaints.

One of the other things about the morale survey is it contained more rosters of names. At this point when I was trying to track down the women, I would plug their maiden names—because these lists usually contained maiden names—into Ancestry.com, get their married names, plug their married names into the LexisNexis database that can sometimes give you phone numbers, and attempt to make cold calls to the women, many of whom were no longer alive. But every now and then a woman would answer the phone, and I

would say, "I found your name in a 75-year-old document in the National Archives, and I'd like to talk to you about your codebreaking work." One of the women mentioned in the morale survey who loved her work was Dorothy Ramale. She lived in an assisted living facility in northern Virginia. After cold-calling her, I went there and interviewed her in person.

Dorothy Ramale's story gives you a sense of why the women were so powerfully motivated to say yes when they were invited to do this work.

> A bus came, and it was at 2 o'clock in the morning that the Army sent a bus to get these—oh, I don't know, it seemed to me that it was all the men, you know, that there were no men left in the college at that time because they all had to go, I think, to Pittsburgh. You see, since I was taking mathematics at this time; I was one of maybe two girls that were in the classes, you see. So I knew so many of the fellows that were going on that bus, and I'll never forget it.[11]

Ramale was enrolled at Indiana University of Pennsylvania, a teacher's college at that time. She aspired to teach high school math, but back then, women were discouraged from going into math. They often weren't hired as math teachers, which is why there were so few women in the math class. She remembered virtually all of the men on campus being rounded up and taken to the recruiting station. And she got tears in her eyes even 75 years later, remembering the sight of her male friends and colleagues disappearing. So, when she was invited by the dean of women to start taking the army's cryptanalytic training course, she immediately said yes—to do her part to try and bring those classmates home. What I love about Dorothy Ramale is that she did also become a math teacher after the war. She ended up staying in Arlington, teaching (among other places)

at Swanson Middle School, which was the middle school that my own children would later attend. I love the thought of these middle schoolers taking Miss Ramale's Algebra I and Algebra II classes, having no idea that this sweet, kind woman had been a truly badass codebreaker during World War II. In fact, she was so good and so sought after that the navy ended up stealing her from the army by offering her an officer's housing allowance. After the war, her naval service qualified her for the GI bill, which she used to get her master's degree and a higher teaching salary.

It was very laborious work. I know you are all familiar with laborious work. Sometimes it's the only way you can get the job done. There is a well-known Arlington Hall photograph of Ann Caracristi sitting at her desk next to a dead plant and laughing down at her work. Caracristi would stay with the work her entire career. She and a former West Virginia schoolteacher named Wilma Berryman broke the digits at the beginning of every Japanese Army message that told the addresses of who sent the message and who received it. [A photo of Berryman is in David Sherman's article in this issue. —Ed.] This information was included in daily intelligence reports that were given to the Pentagon. That information allowed the Pentagon to compile the Japanese order of battle, which was showing the location and likely movements of the Japanese Army troops.

I was able to find the organizational charts that again substantiated where Caracristi worked and also the people she worked with. In my interviews, she remembered beloved young colleagues like Ben Hazard and Anne Solomon. I was able to find confirmation of her memories in the National Archives as well.

* * * * *

Question from audience: Just curious if any of them talked about their needs to keep up

with the systems as they evolved during the war. Was that a special challenge, or were they tracking from the get-go?

Answer: Keeping up with systems as they evolved during the war was a huge challenge. [Many of the women I interviewed] who had received secret training during their senior year of college said that the training, rigorous as it was, had not fully prepared them for a five-digit code system, with five digits added to encipher it. During their early training, they learned to take frequency counts and other basic tactics, but then they had to learn on the job and innovate on the fly. The women (like Dot) who were recruited without the benefit of training in their senior year were really just thrown into the work. They had to learn on the job and be plugged into these assembly lines. The Japanese were working with big paper code books and additive books, and embedded in the code systems would be an indicator that would say which additive book had been used and in which page to find the indicator. But the Japanese were routinely changing the code books and the additive books. Ann Caracristi remembered that when the Japanese were on an island and the ships had been sunk, the stranded Japanese encipherers couldn't get more books, so they would have to sort of cannibalize the old books and rearrange them in different ways, and they would get radio messages telling them how to reconfigure the code books. She also remembered working through the night to try to break back into the system to try to figure out how the books had been rearranged. The Japanese would sort numerical lines and make them into tables in different ways, and so the Arlington Hall codebreakers would figure out the strategies the Japanese were using to make use of what were outdated codebooks. Thanks for the question.

* * * * *

I also found photos of the women who were breaking the PURPLE code, which the Japanese diplomats used to communicate during the war. Thanks to a woman named Genevieve Grotjan, we had broken that machine cipher in September 1940. The US Army then built a replica of the machine the Japanese diplomats were using to communicate with Tokyo.[12] Among one of the many pieces of intelligence from those reports was the information that Japanese diplomats had been invited to tour the coast of France. They reported back to Tokyo where the coast was well-fortified and where it wasn't. As a result, when we were planning the D-Day landing, we knew that Normandy was not as fortified as Calais. That kind of intelligence was critical to the liberation of Europe and the outcome of the war.

There was a unit of African-American employees at Arlington Hall that was working the codes and ciphers used by the private sector, to see if any companies or banks were doing business with Hitler or doing business with Japanese companies like Mitsubishi. There was an oral history that was already declassified from Benson K. Buffham, who was their supervisor. The unit was segregated because the US Army was segregated; they put a white man in charge of this unit of incredibly accomplished college graduates who had achieved their education in a segregated US school system and were now dedicating their efforts to the war. Fortunately, CCH had produced a booklet about their work that was very useful in my research.[13]

The army was also involved in deception operations. Women at Arlington Hall designed "dummy traffic" to try and trick the Germans into expecting that the D-Day landing would take place at Calais instead of Normandy. One photo showed a WAC—a member of the Women's Army Corps—presenting a chart to a group of male army officers, explaining how the dummy traffic worked.

Women Cryptologists and the Navy

The US Navy had its own codebreaking operations on Nebraska Avenue where the Department of Homeland Security is now located. That building had been a girls' school called Mount Vernon Seminary. The students were moved out and had to take classes at Garfinckel's department store, which some of you may remember—I do. The navy moved into the facility and began working on the German Enigma ciphers, the U-boats in the Atlantic Ocean, and the Japanese Naval Fleet Code in the Pacific.

Unlike at Arlington Hall, where most female cryptanalysts remained civilians, the US Navy admitted the women into its ranks. This was thanks in part to leading advocates for women, such as the deans of women's colleges, who were (figuratively) hammering on the door of naval headquarters, saying, "These women will not be just an auxiliary; they will be part of the US Navy."[14] They argued that naval service would offer an opportunity for women to demonstrate leadership. The navy resisted at first in ways large and small: even after admitting the women, some admirals didn't want to give the women navy blue uniforms; they wanted them to wear gray or khaki and be an auxiliary unit. But the case was successfully made that the women deserved navy blue just as the men did. I found photos of the women wearing tailored navy blue uniforms, crossing Nebraska Avenue to get from barracks to work. I was also able to find photos of the women as new recruits, as well as some of their college photos. One 1942 graduating class photo included Jacqueline Jenkins Nye, the future mother of Bill Nye, a.k.a. Bill Nye the Science Guy, and her friend, Gwynneth Gminder. They spent their senior year training to become navy codebreakers. That first group of navy women were secretly tapped by their college professors. They were trained and brought to Washington where they would become officers in the US Navy Reserve.

After the war, some outranked their own husbands, a seniority which—oral histories reflect—they deployed sometimes in marital disputes.

The gray boxes at the National Archives also contained monthly memos the navy produced before and during the war, which showed where the navy was finding its cryptanalysts and what the recruits were being trained to do. Before the war, the navy codebreaking office was very small. It had to ramp up quickly after Pearl Harbor, which meant naval officials had to find thousands and thousands of codebreakers. As the men were shipping out, the officials had to locate a new source, an educated labor force comprised of people with the sort of pattern-seeking minds needed to work these codes and ciphers. By comparing the fall 1941 memos to the winter 1941 documents generated after Pearl Harbor, you can see the moment when a lightbulb went on over somebody's head and they asked, "Where are we going to find our thousands of codebreakers?" Suddenly, there's a new source: women's colleges. The navy tapped Goucher College in Baltimore. They tapped the Seven Sisters schools in the Northeast.[15] The women in the class of '42 were summoned to individual meetings and asked two questions: "Do you like crossword puzzles?" and "Are you engaged to be married?" If they answered yes to the first and no to the second, they would be invited to take the navy's difficult cryptanalytic training course. Some of the course materials are still available in the National Archives.

As I learned more about codebreaking and the principles behind it, I occasionally would tell myself: "All right, I'm going to try one of these problems that the women studied during their senior year." They were learning to take frequency counts, they were learning how to make tables, like a Vigenère Square. They were also learning arcane codebreaking techniques that dated back to the Renaissance. But whenever I tackled one of the complex word problems they'd encountered,

I would give up after a while, telling myself that as an author I didn't have to actually do the problem—I just had to understand the principles.

Also floating around in the files at the National Archives in College Park were photos of the navy's women cryptologists at work. In addition to depicting the wonderful, collaborative rooms where the women were working the Japanese Naval Fleet Code, the images show the camaraderie they enjoyed.

During the course of this research, I was able to use the records to find more living women to interview. Sometimes the effort would involve a lot of labor, but other times their names would fall into my lap. A woman I know whose mother went to Wellesley, class of '43, visited her mom at her assisted living facility in Maine. She came back and said, "Well, I've got three for you." She'd been sitting in the dining room at this facility and had talked about my book project. Two of the women at the table raised their hands and said, "I did this work." Then they put her in touch with a third woman. I went up to Maine and interviewed all of them, one of whom, Jane Case Tuttle, remembered a conveyor belt in some of the rooms where they worked. I was trying to visualize the setup she described; back at the National Archives, lo and behold, there was a photo of the conveyor belt passing messages along. Jane Tuttle also remembered the stacks of Japanese messages she had to sort and prioritize. These were numerical code systems—five-digit code groups—that had then been enciphered with five more digits using non-carrying addition. The women had to subtract the additives to get down to the code group and figure out what it stood for. They had to prioritize messages as the Americans were pushing across the Pacific, trying to retake the islands and land masses that the Japanese controlled. These were dangerous, hard-fought amphibious landings and sea battles that the women were supporting. Jane recalled that they could tell what was happen-

ing in the Pacific because the stack of messages would get larger. There are photos corroborating that. I also found memos in the National Archives informing the women that something was about to happen in the Pacific. The memos basically said: we can't tell you what is about to occur, but we need you to work faster. We need you to recover more additives than you did last week. I also saw memos congratulating the women for not only meeting but exceeding their quotas.

Ann Barus Seeley, Smith College class of 1942, worked the Japanese Naval Fleet Code. In her interview, she explained the process of recovering additives and noted that each "code group has a meaning. The code group can be a word or a phrase or a sentence or Roman letter and we are dealing with Japanese, you know, so they didn't often use Roman letters, but sometimes they had to." Her memory of the work was so precise that she explained that since there was no Japanese word for "Roosevelt," the Japanese would have to use the code group for each letter of his name. She remembered the additive recovery process, and doing false addition and false subtraction where you don't carry the ones. She showed me how she did it—and even got a bit irritated when I seemed slow on the uptake. She also remembered certain kinds of messages they would look for. One was a *shoo-goichi* or "noon position" message. A Japanese ship would send a message that said where it was going to be at noon the next day, which is not a secure practice at all. The women would look for these *shoo-goichi* messages in order to quickly get that intelligence to the submarine commanders who would know where the ship was going to be at noon the next day. As she described this, I wondered how I could corroborate that. Fortunately, at the National Archives, I saw the expression *shoo-goichi* message many times in the records, along with words like *overlapper*, which Dot had recollected. It was amazing how the paper records

substantiated what they recalled. They wouldn't always remember a lot; some remembered more about their personal lives. Others remembered some aspect of their work or what the rooms looked like, but what they did remember, they remembered accurately.

The boxes also contained examples of the five-digit Japanese Naval Fleet Code, including work sheets complete with handwritten pen and pencil markings. The women I interviewed remembered that the code group had to be divisible by three. This was what was known as a garble check: if a group was divisible by three, the Japanese receiving the transmission would know that it had not gotten garbled; that it had come across the airwaves intact. I found examples of documents with penciled-in numbers divisible by three. The women also remembered that they could quickly verify that five-digit numbers were divisible by three by striking out all the threes, sixes, and nines; then, if the remaining digits when added together were divisible by three, that meant the original five-digit number was divisible by three. Seventy-five years later, they still recalled these tricks they had used to decipher the messages.

Some of the other messages used something called the inter-island cipher that the Japanese would use to communicate between ships and islands. It was a smaller code system, but it used a table and romanized Japanese. There was a group of women from Wellesley who had to break that monthly key. I read a declassified oral history by their commander, Frank Raven, who remembered how good the women were at their work. He also remembered their partying spirit. There was a lot of alcohol in Washington during the war, and the women would have big parties sometimes. The officers could live together outside of the barracks in group houses. The women would come to Raven and ask, "Well, when can we have our next big party?" Raven would look at the wall calendar to see when the key was going to change, and

tell them they could have it on such and such a day because then they'd have two weeks to recover from their hangovers before they had to get back to work on the key.

The work of these women was also instrumental in the shootdown of Admiral Yamamoto's plane in April 1943. The Japanese messages were transmitted in both the Japanese Naval Fleet Code, which men like Joe Rochefort were breaking on site in the Pacific, and in the inter-island cipher that the women in Washington were working. And both groups—the men and the women—worked together to put together his itinerary so that his plane could be shot down. One woman remembered that cheering went up in the codebreaking compound when they heard that Yamamoto's plane had gone down. Even a nugget like that in an oral history is important when you're writing for a lay audience. As an author, I had to convey how urgent and exciting this work was in order to get readers to really care, to really feel like they are there.

There were also navy women operating the *bombe* machines constructed in Dayton, Ohio, to break the Enigma enciphered messages sent by German U-boats in the Atlantic.[16] Other women designed the menus for setting up the *bombe* machines, to test a possible key setting. I read an oral history conducted at the National Cryptologic Museum when one of them, Jimmie Lee Hutchison, was visiting. She remembered working the *bombe* machines during the D-Day landings. Many of the women experienced the landings, because they were reading the German messages as the Germans were reacting to the sight of all the Allied ships on the English Channel. Jimmie Lee was working the *bombe* machine, really working hard to decipher the messages. Her fiancé was a glider pilot during the D-Day landings, and he did not survive. She realized for the first time how important her work was when she was not allowed to leave her post to attend his

funeral. That was true for the other women as well because Allied troops were pushing the Germans through Europe, and the women were going to have to keep working and reading the messages.

Record Availability

It was incredible to me how feasible it was to corroborate almost everything that the women remembered with the huge paper trail that exists in the National Archives. I was very surprised—and it really made me angry—to see the existing record that had been sitting there for decades, with all of these photos of women and all of these names of women. Yet the histories that have been written about the war, the big books about codebreaking in the Pacific or in the Atlantic, had left them out almost entirely. It wasn't as though the material was still classified and waiting for somebody to file Freedom of Information Act (FOIA) requests.[17] I had to do that for some oral histories, but, for the most part, the material was there. It had just been ignored.

Researchers talk about something called confirmation bias, where you see what you expect to see. I think for decades historians were expecting to see the name Joe Rochefort and the names of the important naval officers, and William Friedman and the names of men who worked for him. They had just not focused on this mass of paper records containing all of these women's names. It was very surprising to me to see how much material was already there.

I submitted a lot of FOIA requests and Mandatory Declassification Review (MDR) requests. The CCH historians ultimately recommended going the MDR route because the NSA FOIA office, whose job is to review each request related to classified cryptologic material—was burdened by routine FOIA requests. I got a lot of oral histories declassified via the historian's office. I was very grateful for the advice of the CCH about how to go about this. I had never submitted FOIA

requests at this high a volume, and appreciated guidance about how to get the material released. So again, thank you. I mined every record that I was able to get declassified, records that many of you probably worked on, and it really added up.

Conclusion

It was extraordinarily moving to sit with these women and give them an opportunity to tell their stories and get credit for the work that they did. Ultimately, more than 10,000 women came to Washington to do this work. Codebreaking, we're told, shortened the war by at least a year and a half; it saved thousands of lives on all sides, Allied and Axis, because the war ended sooner.

I couldn't have completed this book without your work, without the efforts of people who are declassifying material and the historians whose job it is to tell the story of the intelligence agencies, to tell us about our history, to help us understand the past and the achievements, the mistakes, all of it, to get it out there so that we have a sense of who has contributed to our history. Of course, a lot of this work had to be secret for a long time, but it didn't have to be secret forever. It's critically important to fill in the story of American history and American life, to inspire people to go into intelligence work, into public service, to get girls into STEM [science, technology, engineering, and mathematics], and to give these women credit for the work that they did. So, I thank all of you for the work that you do because I could not have told the story just based on what the women remembered. I could not have told it credibly unless there had been a paper record, so it could not have been written without your work.

Sometimes I'll get two or three emails a day from people saying, "My mother did this work," and I can direct them to the National Archives in St. Louis where they can often get their mother's personnel records. After the book was published, I heard from about 20 more women codebreak-

ers. I was relieved because nobody had significant information that I had overlooked or corrections; it was mostly amplifications. And in the paperback version, I was able to write an afterword and include some of these new stories. My favorite was the memory of a son, Norman Torkelson. He remembered when their family had been sitting around, watching television—I think it was a *60 Minutes* episode on the Battle of the Coral Sea, which was the first battle of World War II that really employed and turned on our ability to break the Japanese Naval Fleet Code. The family knew that their mom, Jean Theresa Pugh, did something during the war, but they didn't think it was important. After the program was over, their mom said, "Well, kids, I guess I can tell you what I did in the war now, since it seems to be out there." The kids asked what, and Pugh's husband, Harold, said, "Oh, yeah, your mom was a secretary during the war." She said, "No, Harold. I worked that code system, and my girls and I broke that code system; so that's what I did during the war." She sat up and high-fived everybody in the room. So, she was able to set the record straight. It was wonderful to get the extra anecdotes, and I was really happy to be able to include them in the paperback … and I think they're in the e-book now, too.

As I mentioned, thanks in part to the popularity of *Hidden Figures* as well as other books documenting pioneering work in science, computing, and technology by women and citizens of color, publishers and movie producers are showing more appetite for stories about women's contributions to history. And among the public, there is a new willingness to believe that these stories are true and important. *Code Girls* has been optioned by a production company and there's a very good screenwriter working on it, who did the screenplays for *Band of Brothers* and *The Pacific*, both big stories of men's heroic achievements in World War II. While talking with the screenwriter about

his work, he said he'd always thought about men and how they are changed by wars. He's become very enamored of the question of women and how they are changed by war as well.

There were so many days when I was writing the book and feeling really overwhelmed by the amount of information, the difficulty of comprehending it, the number of pages I had just printed out. I would think about the women and the work that *they* had been doing and how overwhelming it must have felt during war time. And I would think, "Well, they got up every morning and gave it their best. I'll do the same thing."

Notes

1. "The Foreign Relations Authorization Act for Fiscal Years 1994 and 1995 created the Commission on Protecting and Reducing Government Secrecy to conduct 'an investigation into all matters in any way related to any legislation, executive order, regulation, practice, or procedure relating to classified information or granting security clearances.' … It happened that the National Security Agency, our signals outfit—successor to the Army Signals Intelligence Service and the army security agency and under the leadership of its deputy director, William P. Crowell—was beginning to think it time to reveal some of the things that the army had learned about Soviet espionage in those years. After all, the Soviet Union had disappeared, and the code-breakers who had decrypted the secret messages were in their late years, still unacknowledged. And now there was this new commission. In short order it was determined to turn the Venona decryptions, as they were called, over to the commission." Daniel Patrick Moynihan, *Secrecy: The American Experience* (New Haven, CT: Yale University Press, 1998), 59, accessed May 10, 2021, https://archive.nytimes.com/www.nytimes.com/books/first/m/moynihan-secrecy.html.

2. Robert L. Benson, "The Venona Story," accessed May 6, 2021, https://media.defense.gov/2021/Jul/13/2002761786/-1/-1/0/VENONA_STORY.PDF.

3. From the mid-1940s to the mid-1950s, Arlington Hall was the headquarters for the National Security Agency and its predecessor organizations, the Armed Forces Security Agency and the Army Security Agency. *Historic Photographs of NSA and its Predecessor Organizations*, accessed April 26, 2021, https://www.nsa.gov/Helpful-Links/NSA-FOIA/Declassification-Transparency-Initiatives/Historical-Releases/Arlington-Hall/.

4. MAGIC: American cover term for decrypted Japanese diplomatic messages. Purple: Machine used by the Japanese during World War II to encrypt diplomatic traffic. Enigma: Machine used by the German Army during World War II to encrypt messages. ULTRA: British cover term for high-grade decrypted messages, especially from the Enigma; cover term adopted by the Americans during World War II.

5. "Finding aids are tools that help a user find infor-

mation in a specific record group, collection, or series of archival materials." US National Archives, archives.gov.

6. "One of the bookish men, a New York editor named William Smith, referred to Arlington Hall's contingent of female southern workers as the 'Jewels.' It was a lofty and rather snide reference to the number of women working there whose parents had seen fit to name them after precious stones." Liza Mundy, *Code Girls: The Untold Story of the American Women Code Breakers of World War II* (New York: Hachette Books, 2017), Kindle edition, 207.

7. Kahn writes: "In World War II, cryptanalysis helped make possible at least four critical events—Midway, Yamamoto, the rapid cutting of Japan's lifeline, the defeat of the U-boats." Both Midway and Yamamoto were the result of breaking the naval fleet code. Cutting the lifeline was 2468 and sinking of supply ships. U-boats were Enigma. David Kahn, *The Codebreakers: The Comprehensive History of Secret Communication from Ancient Times to the Internet* (New York: Scribner, 1996), 612.

8. To contact the National Archives in St. Louis, visit https://www.archives.gov/st-louis.

9. In 1942, Gordon Parks worked as a photographer for the Farm Security Administration (FSA). In 1943, he worked as a photographer for the Office of War Information (OWI). The Gordon Parks Foundation, accessed April 26, 2021, https://www.gordonparksfoundation.org/gordon-parks/chronology.

10. In 1941, Esther Bubley was hired by the National Archives and Records Administration (NARA) to work with microfilm. In 1942, she became a dark-room assistant for the Office of War Information (OWI). Soon afterwards she became an OWI photographer. Bonnie Yochelson, "Biography of Esther Bubley," accessed April 26, 2021, https://www.estherbubley.com/bio_frame_set.htm.

11. Dorothy Ramale, interview by Liza Mundy, May 29 and July 12, 2015, Springfield, VA.

12. Grotjan's breakthrough enabled the Army Signal Intelligence Service (SIS), a precursor to NSA, to build an analog machine that solved the Japanese diplomatic system known as Purple. "Genevieve Grot-jan Feinstein," accessed April 26, 2021, https://www.nsa.gov/History/Cryptologic-History/Historical-Figures/Historical-Figures-View/Article/1621585/genevieve-grotjan-feinstein/.

13. See Jeannette Williams, *The Invisible Cryptologists: African-Americans, WWII to 1956*, accessed April 26, 2021, https://media.defense.gov/2021/Jul/13/2002761529/-1/-1/0/INVISIBLE_CRYPTOLOGISTS.PDF.

14. "On July 30, 1942, President Franklin Roosevelt signed the Navy Women's Reserve Act into law, creating what was commonly known as the WAVES—Women Accepted for Volunteer Emergency Service—a division of the US Navy created during World War II to free up male personnel for sea duty." Donna Cipolloni, "Remembering Navy WAVES During Women's History Month," March 3, 2017, accessed May 3, 2021, https://www.defense.gov/Explore/News/Article/Article/1102371/remembering-navy-waves-during-womens-history-month/.

15. "The Seven Sisters, a consortium of prestigious East Coast liberal arts colleges for women, originally included Mount Holyoke, Vassar, Smith, Wellesley, Bryn Mawr, Barnard, and Radcliffe colleges. Today, five of the Seven Sisters remain women's colleges; Vassar is coeducational and Radcliffe has merged with Harvard, becoming the Radcliffe Institute for Advanced Study." "The Seven Sisters," accessed April 27, 2021, https://www.mtholyoke.edu/about/history/seven_sisters.

16. "Over the course of the war, 121 U.S. Navy cryptanalytic *bombes* would be built by Navy personnel at Dayton's National Cash Register Company and shipped to the Navy's Communications Annex in Washington, D.C." Jennifer Wilcox, "The Secret of Adam and Eve," accessed April 28, 2021, https://media.defense.gov/2021/Jul/13/2002761532/-1/-1/0/SECRET-ADAM-EVE.PDF. For information about the original *bombe* built at Bletchley Park, visit https://bletchleypark.org.uk.

17. The Freedom of Information Act (FOIA) provides the public the right to request access to government records. See https://www.foia.gov/ for more information.

Evelyn Akeley:
Training Army Codebreakers
During World War II

David Sherman

Introduction

Evelyn Niemann Akeley's contributions to the US World War II effort remained unknown for years except among a small circle of friends and colleagues. Although secret, that legacy was impressive. Akeley built a training course for codebreakers who broke every major code used by the Japanese Army during the war. One was a seemingly unimportant code that Tokyo used to direct troop and supply convoys to the far-flung outposts of its Pacific island empire. Once this code was solved in mid-1943, the resulting intelligence bonanza allowed American submarine captains to sink an overwhelming majority of Japanese merchant ships, severing Tokyo's supply lines and starving its isolated soldiers. Another code solved by Akeley's former students was that used by Japan's wartime representatives in Nazi-occupied Europe; those detailed Japanese reports on Germany's coastal defenses in France when decrypted provided crucial intelligence to American and British officers planning the D-Day invasion. As no less an authority than Army Chief of Staff George C. Marshall would say, codebreakers such as Akeley not only helped win battles; they set the stage for what had seemed an interminable conflict with ever-in-

Evelyn Niemann, 1928. Smith College yearbook, Smith College Special Collections

creasing body counts to finally end, and to end in victory.[1]

As an assistant professor of mathematics during the 1930s at a small upstate New York col-

lege for women, Akeley would not have antici-pated the unexpected turn that her life took after the December 7, 1941, Japanese attack on Pearl Harbor, one that led her away from continuing a successful academic career. The next spring, she was recruited by the army's Signal Intelligence Service, or SIS, a Washington-based secret orga-nization dedicated to breaking the codes and ciphers that protected the most prized secrets of Germany and Japan.

Between 1942 and 1945, thousands of Amer-icans—many of them women—would join Ake-ley in Washington. There, they tested their skill at reading enemy communications, operating complex codebreaking machines, and performing the myriad administrative functions required by the rapidly growing organization. Akeley's own assignment was unique and critically important, however. She was to train the hundreds of new recruits arriving in Washington each week on what codes and ciphers were and how to crack them. Her decade of experience teaching math-ematics, a basic understanding of which was key for an aspiring codebreaker, provided a solid foun-dation for this task. There was only one problem. Like her students, Akeley had no experience in breaking codes.

Akeley had at most two months to prepare for her new assignment after the army's recruit-ers approached her in March 1942. Before hiring her, the SIS may have sent her materials on cryp-tology—the relatively new science of the centu-ries-old human endeavor to make or break secret messages meant only for the sender and recipi-ent—that it had developed during the 1930s to train the modest number of personnel hired before Pearl Harbor. Akeley might have reviewed some of this coursework before her arrival, although there is no evidence she actually did so.

With this minimal preparation and under the intense pressure faced by American code-breakers in the months after Pearl Harbor, Ake-ley began work in Washington. Working almost single-handedly and with only a few SIS training manuals, she created an education program that became a critical pillar in an organization capable of taking on some of the most complex codes and ciphers then in existence.

Upon finishing their training, her first stu-dents struggled for a year with little codebreaking progress. Then, in April 1943, they broke what at first glance might seem an unimportant code Tokyo used to route supply convoys throughout its far-flung island empire. Over the next few years, however, their success enabled American commanders to sink a high percentage of Japan's merchant fleet, thus cutting off large numbers of Japanese troops from needed food and weap-ons. This codebreaking victory was only the first achieved by those whom Akeley had trained. They went on to break every significant encryp-tion system the Japanese used during the war. The resulting intelligence had a major impact on the course of the war in the Pacific and made a vital contribution to the Allies' ultimate victory.

College Years at Smith and Columbia

Evelyn Clara Niemann was born in Manhat-tan to Albert and Julia Niemann on August 24, 1907. Albert's family had emigrated from Ger-many before he was born in the late 1870s. Julia was from Philadelphia, but at least one set of her grandparents had also come from Germany. At the time Evelyn was born, Albert was working as a salesman of men's clothing.[2]

In 1924, Evelyn left her family home in the Bronx to attend Smith College in Northamp-ton, Massachusetts. Smith, which opened in 1875, had around 2,000 students when Akeley arrived, making it the largest women's college in the United States. In the years after World War I, with more and more young American women interested in a college education, rising enroll-ments at Smith meant campus housing could be

Evelyn Niemann, front row center, captain of the Smith College soccer team. 1928 yearbook, Smith College Special Collections

offered to only half of the student body. College President William Neilson undertook a major construction program that ultimately would add 15 additional residence halls, each able to accommodate 70 to 80 students. Six halls opened in the years immediately before and after Akeley's arrival, which allowed students to have small, private rooms, with social activities held in first-floor common areas.[3]

Neilson's tenure, notes one history of Smith, was marked by an emphasis on student awareness of events beyond the United States, something which he encouraged "through the founding of the Junior Year [abroad], a very cosmopolitan faculty, and his weekly Chapel talks which did so

much to counterbalance the wider movement to avoid Europe and the world."[4] Smith also emphasized a liberal education for its own sake while offering women interested in professional careers—for which a specialized college degree was becoming increasingly necessary—an opportunity to pursue advanced undergraduate training in specific disciplines, including mathematics. It was this field that Akeley chose as her major.[5]

The mathematics faculty at Smith during the mid-1920s featured four women with doctorates in the field, striking given that the first woman to earn the degree at an American university, Winifred Edgerton, had done so only in 1886, and only a few dozen women in the United States held

Skidmore Hall, main building at Skidmore College, Saratoga Springs, NY, 1931. George Bolster Collection, Lucy Scribner Library Special Collection

mathematics doctorates.[6] Two of the Smith mathematics professors had obtained their doctorates from the University of Michigan and two from Yale University, thus making Smith's mathematics program one of, if not the, strongest at a women's college nationwide.

The longest serving professor in Smith's mathematics department when Akeley matriculated was Ruth Goulding Wood, who had earned a doctorate at Yale in 1901.[7] A specialist in non-euclidean geometry, Wood graduated from Smith in 1898 and returned as an instructor in 1902. Advancing to associate professor in 1909 after a year of postdoctoral research in Germany and then to a full professorship in 1914, she was a strong advocate for requiring mathematics for all Smith students and saw it as an essential foundation for the college's courses in the sciences.[8]

Another Smith graduate who returned to teach mathematics during Akeley's student years was Suzan Rose Benedict, class of 1895. With a master's from Columbia University, Benedict

joined Smith's faculty in 1906. She then earned a doctorate in mathematics from the University of Michigan, the first woman to earn one there, and returned to Smith as an associate professor. Following a decade as the college's dean of students, she was promoted to full professor and department chair. Her work focused on the history of mathematics and the development of the college's collection of rare books on the subject.[9]

Smith's other two mathematics faculty members with doctorates while Akeley was a student were Susan Miller Rambo and Ethel Louise Anderton. Rambo's career paralleled Benedict's: undergraduate degree from Smith and PhD from the University of Michigan, becoming the second woman after Benedict to do so. Like Benedict, she also achieved the rank of full professor and served as department chair.[10] Anderton, Smith's fourth mathematics PhD during Akeley's time, was on its faculty briefly, teaching at the college during Akeley's senior year.[11]

Akeley majored in mathematics at Smith; was president of the Mathematics Club; and was a member of the society for physics, her second field of study. She played in the Smith orchestra's first violin section, sang in the glee club and choir, was captain of Smith's soccer squad, and played on its baseball team.[12] As an undergraduate at Smith, Akeley received not only one of the best educational experiences in mathematics then available to a young woman in the United States, but also access to some of the strongest female role models in the field.

Upon graduation, Akeley enrolled in Columbia University in the fall of 1928 to pursue a master's degree. This also enabled her to live with her parents. While at Columbia, she held two jobs, selling life insurance for the Mutual Life Insurance Company and working as a statistician at American Telephone and Telegraph. By May 1930, she was teaching mathematics at Washington Female Seminary in Washington, Pennsylvania. Like a number of similar institutions, the school had been founded in the nineteenth century to provide young American women with educational opportunities denied them at the nation's male-only colleges.[13]

A Decade in Academia

In the fall of 1931, having received a master of arts from Columbia, Akeley joined Skidmore College's faculty as a mathematics instructor. She also was hired to teach physics. Initially her appointment was on a semester basis and renewed each term until the fall of 1933, when it was made permanent. Her parents moved to Saratoga Springs in 1932 and lived with Akeley.[14]

Skidmore, like a number of other American women's colleges, began as an institute that sought to provide instruction in bookkeeping and typing—secretarial work, like nursing and teaching, was one of the few professions open to women at the time. In 1922, the college evolved into an undergraduate degree institution with a liberal arts curriculum.

That Akeley was hired even as the Great Depression was taking a toll on institutions such as Skidmore presumably reflected her talent as a mathematician and a teacher. Finding employment at the college, moreover, allowed her to avoid what one historian of women's higher education in the United States has noted as "one of the side-effects of the thirties," which was "to sideline thousands of intelligent and well-educated women into a lifetime of unpaid volunteer activities" and to reinforce the belief that any woman joining the workforce deprived a man of a job.[15]

Prior to Akeley's arrival, the responsibility for the college's mathematics and physics curriculum was taught by a single professor, John Remington Hobbie. Hobbie, a Columbia physics PhD, joined Skidmore's faculty in 1922 and later took on administrative responsibilities as its superintendent of facilities. Hobbie's status as the sole faculty member responsible for a specific area of
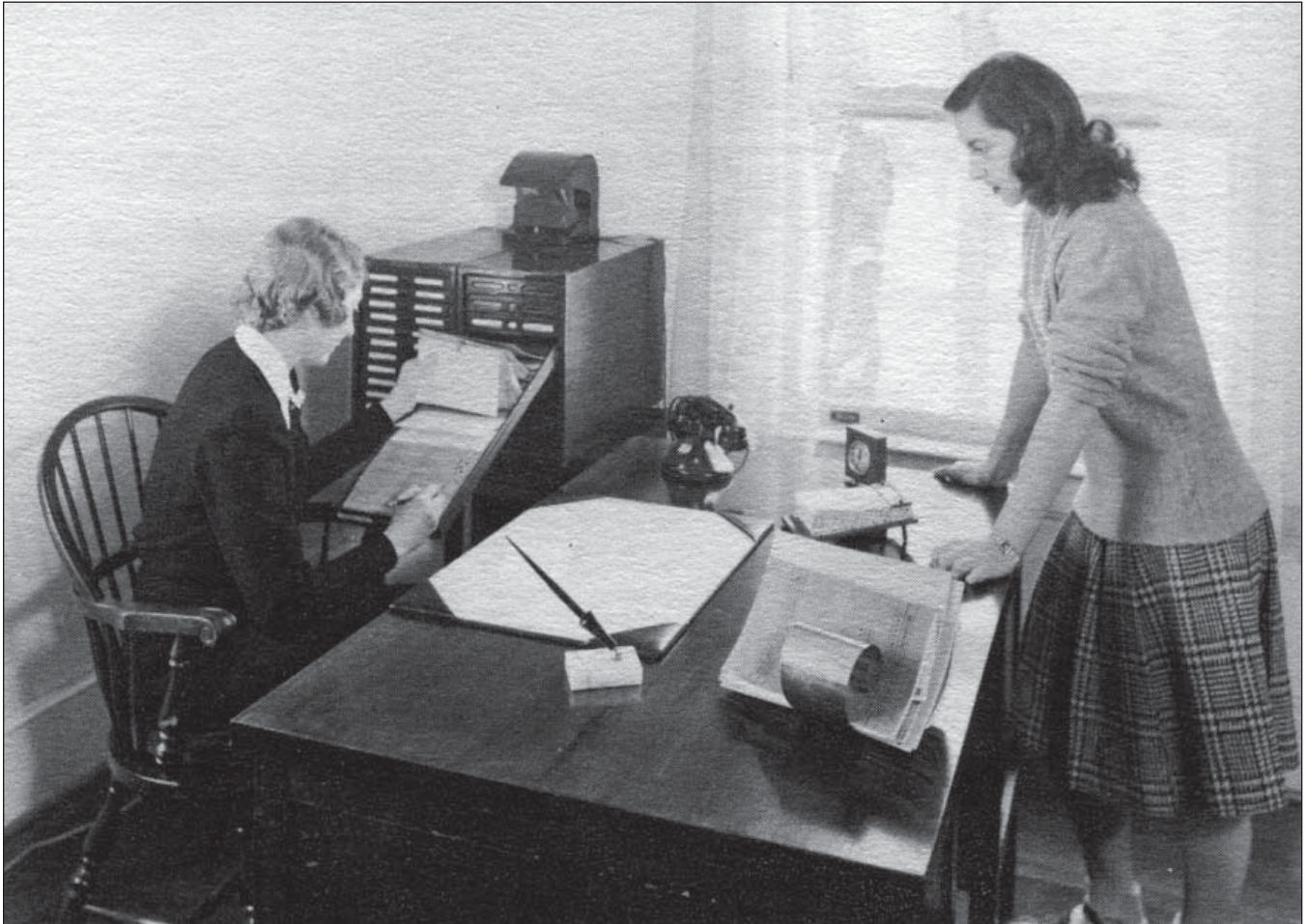
Evelyn Akeley was the head of the Skidmore College Vocational Bureau in 1940, when this photo was taken. It likely shows her advising a student. Skidmore College Bulletin 1940-1941

instruction was not unusual; the same was true for Skidmore's philosophy, religion, and German courses. With Akeley's arrival, Hobbie focused on specialized physics instruction while she took over the mathematics curriculum. Akeley's core teaching responsibilities, which included algebra, geometry, trigonometry, calculus, and a shorter physics course designed for students not majoring in the sciences, placed her in the classroom 6-13 hours each week, depending on the semester. When sufficient numbers of students enrolled in additional specialized offerings, her course load may have been greater.[16]

In November 1934, Akeley's parents announced in the *New York Times* her engagement to Edward Stowe Akeley of South Dakota, professor of theoretical physics at Indiana's Purdue University. Thirteen years Evelyn's senior, Akeley was the son of University of South Dakota professor Lewis Akeley (one of whose students, Ernest Lawrence, won the 1939 Nobel Prize in Physics for inventing the cyclotron). Evelyn and Edward married on June 5, 1935, and honeymooned in Switzerland. By the start of Skidmore's next academic year, Evelyn had been promoted to assistant professor. In April 1936, she and Edward

attended a meeting in New York City of the American Mathematical Society. Edward was already a member, and during the session Evelyn was elected a member by the Society's governing council.[17]

Edward returned to his Purdue physics professorship, and Evelyn moved onto the Skidmore campus and became the head of a series of undergraduate residence halls. Her parents returned to New York. Evelyn apparently remained at Skidmore during the spring of 1937, when Edward held a fellowship in the theory of relativity at the Institute of Advanced Study in Princeton, New Jersey. Among the faculty of the Institute's School of Mathematics during Edward's semester there was Albert Einstein. Also in residence were John von Neumann and Oswald Veblen, who developed one of the first digital computers, ENIAC.[18]

At some point before the outbreak of war in Europe in 1939, Evelyn's marriage to Edward Akeley ended; by 1938 he was no longer listed as her husband in Skidmore's directory. She appears to have spent the previous summer alone at a cottage she owned in Vermont. She would continue to use Akeley's surname.[19]

In the late 1930s, Evelyn Akeley spent two summers at Ivy League universities, Colum-

Scribner (top) and Thompson Halls, Skidmore College. Akeley served as head of these halls at different times in 1937-1940. George Bolster Collection, Lucy Scribner Library Special Collection

bia and Harvard. In addition to her teaching responsibilities, she began to assume administrative duties at Skidmore. Her first such position was assistant to the dean of the college, a post she was appointed to by the Skidmore Board of Trustees in April 1938. A year later she became assistant director of Skidmore's Vocational Bureau, which facilitated the employment of its graduates. In the fall of 1941, Akeley was promoted to Vocational Bureau director. During these years, she played on the soccer squad, helping defeat a team of undergraduates in the friendly match, and continued to pursue her musical interests, playing in Skidmore's string ensemble and a local quartet.[20]

Akeley also was active in the Saratoga Springs chapter of the American Association of University Women, including as a featured speaker. In February 1941, as the chapter's program chair, she presided over a session for more than 70 local high school seniors that featured Skidmore history professor Alice Warren. Speaking on "Defense and the National Welfare," Warren urged her student audience to participate actively in America's democratic system, as such engagement was the nation's "main line of defense." She also pressed her listeners to "learn something constructive" so that they would be prepared to support the country's defense efforts when it needed them to do so.[21]

Akeley's duties in Skidmore's Vocational Bureau ranged from representing Skidmore at external events—in the fall of 1941, for example, she was present at the inauguration of a new president at Keuka College in western New York—to attending conferences on the placement of female graduates. A number of these were sponsored by Connecticut College and its Institute of Women's Professional Relations and often showcased opportunities in public service for women. One such meeting Akeley attended in Washington in November 1939 focused on career possibilities at the federal, state, and local levels. Three months later, she attended a session in New York

on careers in photography. She also participated in meetings of college personnel officers, guidance counselors, and student aid administrators to assist graduates of Skidmore. In late 1939, Akeley published an article on the importance of financial assistance provided to students by the National Youth Administration (NYA).[22]

The NYA, a New Deal organization established in 1935 as part of the Works Progress Administration, provided support to work-study programs in American schools and encouraged American youth to continue their education and not enter the labor market at a time of mass unemployment. It also funded defense preparedness programs at colleges and universities. Like many aspects of the New Deal, it was criticized by Republicans for funding "make-work" programs, wasting taxpayer dollars, and serving as a training ground for Democratic Party operatives. In her article, Akeley defended the program as providing important skills and work experience that would lead to employment after graduation. She also cited how the distribution of NYA funds was monitored, arguing that she and other college aid officials were careful to direct aid to the neediest students and used "penny-by-penny calculations …worthy of the admiration of an efficiency engineer."[23]

America and Akeley Join the War

Akeley probably learned about the Japanese attack on Pearl Harbor the way many in America did on the afternoon of December 7, 1941: over the radio. Skidmore student Jean Poskanzer heard about the attack in her dormitory room at Circular House when an announcer interrupted a broadcast of the New York Philharmonic with the news. The event, Poskanzer said, "was the shocker of, really, our lives for us, and it changed things for everybody." Her roommate Virginia Gooch heard resident faculty member Nina McClure Pearce tell her assembled charges about the Japa-

nese raid, something that Akeley may have done for her students as well. The next day, Poskanzer would recall, the students again gathered in Pearce's living room to listen to the radio as President Roosevelt declared war.[24]

While the Skidmore faculty and student body seem to have been as divided as the rest of the country between internationalists and isolationists, they had not been unaware of events abroad. "Skidmore took its obligation to inform students of the events of the wider world quite seriously," one historian of the college noted, "and many visiting speakers in the decade described what was happening in Germany under Hitler and in Italy under Mussolini." Many Skidmore faculty and students had traveled abroad during the late 1930s, often to Europe, and would be interviewed by the college newspaper on what they had seen. Some gave lectures on their experiences.[25]

Akeley's participation in the vocational conferences led her into the secret world of codebreaking. Following the attack on Pearl Harbor and the entry of the United States into global conflict, the demand for women with the skills needed to support mobilization of the nation's full defense capability soared. When Connecticut College's Institute of Women's Professional Relations sponsored a meeting in Washington on March 20 and 21, 1942, at the Mayflower Hotel aimed at "bringing together government, industry, and the colleges and universities to discuss their common problem—the demand and supply of qualified workers," Akeley attended.[26]

Representatives came to the meeting from the Seven Sisters colleges—Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, Wellesley, and Vassar—as well as other women's colleges, including Goucher, Hood, Mary Baldwin, Russell Sage, and Wells. They heard dozens of speakers from government, the private sector, and academia on the effort to mobilize the nation's defense capabil-

ities generally and the needs for women with skills in specific fields. Those holding college degrees in Akeley's fields, mathematics and physics, were particularly scarce. President Leonard Carmichael of Tufts University noted that there were fewer than a thousand women with bachelor's, master's, or doctoral degrees in the entire country.[27] George Bailey of the National Defense Research Committee estimated that 25,000 women would be needed in the field of radio alone, to do work ranging from laboratory research to developing, installing, and operating communications facilities.[28] Under Secretary of War Robert Patterson noted that the navy had set up a communications training program specifically for women and the Signal Corps, which was responsible for the army's communications.[29]

The Signal Corps not only managed military communications systems. It also had a small arm, the Washington-based SIS, engaged in highly secret work. Founded in 1930 by the trailblazing American cryptanalyst William Friedman—whose writings a decade earlier had transformed cryptanalysis from a field populated by talented amateurs to one based on mathematical principles and scientific discipline—the SIS was responsible for breaking the encrypted communications of potential adversaries overseas. For most of the 1930s, it consisted of only a few dozen personnel. Interestingly, two—Solomon Kullback and Abraham Sinkov—were present at the 1936 meeting in New York of the American Mathematical Society where Akeley was elected a member. (If either met her, however, he almost certainly would have made no mention of his secret government work.[30])

Being short staffed, the SIS had to choose its targets carefully. Prior to Pearl Harbor, Washington judged the encrypted diplomatic communications of Japan the most important, as Japan was the most likely adversary in the event of war. In this effort, the SIS had considerable success, most

notably in September 1940 when it broke the "Purple" cipher used by the highest level Japanese diplomats posted abroad. This capability enabled the SIS to read every cable between the Tokyo government and its envoys in Washington during negotiations over the next year aimed at reducing tensions between the two nations. The resulting intelligence—although suggesting the rise of a Japanese offensive during the second half of 1941 and, to some, an early December start date—was insufficiently precise to point to Pearl Harbor as its target.

The Japanese attack triggered a massive effort by the Roosevelt administration to mobilize America's capabilities for waging war. As large numbers of the able-bodied men were entering the military for service overseas, organizations such as the SIS that needed personnel for non-combat positions began to look at other groups for potential recruits. They began to focus on women and, in the case of the SIS and others requiring higher levels of specialized expertise, on those with a degree or at least some college-level education. Over time, thousands of women joined its ranks either as civilians or as uniformed members of the Women's Army Auxiliary Corps (WAAC); by 1945, women made up more than half of the 10,000 personnel of the Signal Security Agency (SSA), as the SIS was renamed as it began its dramatic expansion in early 1942.

For these reasons, and because of Akeley's advanced training in mathematics, Signal Corps recruiters likely were very interested in her when they met her at the March 1942 conference in Washington and may have offered her a position on the spot. They might also have given her unclassified training materials on codebreaking to review while she returned to Saratoga Springs to wind up her personal affairs. Regardless of her specific arrangements with the Signal Corps, Akeley was granted a leave of absence from Skidmore in May 1942 and left for Washington.[31]

Although Akeley was one of the first to depart from Skidmore in support of the war effort, 10 other members of the 75-person faculty, including women who taught English, Romance languages, and psychology, ultimately joined her in service to the nation. At least one, English instructor Carol Asch, joined the WAAC, which "she chose over the Navy's WAVES because the WAAC, unlike the WAVES, had 'no color barrier.'"[32] Others served as civilians while remaining at Skidmore. John Hobbie, Akeley's fellow instructor of mathematics and physics, developed new courses in aviation that featured training in the servicing and operation of aircraft. Hobbie's students also served as spotters in the local civil defense program. One who did so from a tower at the Saratoga Springs armory later recalled that, despite there not ever being much activity in the vicinity, one of her classmates thought she spotted a plane with three engines (i.e., German), which she dutifully called into area air defense headquarters in Albany.[33]

Training the Army's Codebreakers

Having arrived in Washington, Akeley went to the War Department, then in the process of moving from the Munitions Building on the Mall (near the present-day Vietnam Veterans Memorial) to the newly constructed Pentagon. Akeley would have gone to the SIS offices in the rear of the building's third floor to learn her assignment: training new SIS recruits in cryptanalysis for roughly two months after they reported for duty. Her background in mathematics and teaching experience at Skidmore made her a logical choice for this position. The only problem was that she had no direct experience in breaking codes and ciphers.

At first glance, it may seem odd that after the Pearl Harbor attack the War Department asked a college professor with no experience in cryptanalysis to take charge of training incoming personnel

how to break the encrypted Japanese communications. However, the SIS had few alternatives. For most of the 1930s, it employed fewer than 20 people including clerks and administrative staff, although with the outbreak of the war in Europe in September 1939 it did gain a few more. Recruiting accelerated in 1940 and especially 1941 as the military situation in Europe shifted dramatically in Germany's favor and tensions rose between Washington and Tokyo. When the Japanese struck Hawaii on December 7, 1941, the SIS had grown to 331 personnel, of whom 150 were stationed at military bases outside Washington performing intercept operations. Of those in Washington, roughly 75 were engaged in actual codebreaking; of these, probably no more than 20 had more than a few months of experience. All were fully occupied before the Japanese attack—the most experienced of them were working to the point of exhaustion, with Friedman being hospitalized for several months after a nervous breakdown—and had even greater demands placed on them once the United States was at war.[34]

Training was on a similarly small scale for most of the prewar period, expanding only in the months immediately prior to Pearl Harbor. In the early 1930s, the SIS's first recruits had learned cryptanalysis at their desks under Friedman's personal tutelage, using what few American and European texts existed at the time. By the mid-1930s, the SIS had established a formal school, although it apparently consisted of a single instructor and probably had no more than a handful of students each year.[35]

In 1935, Friedman completed two new texts for the school's use: *Elementary Military Cryptography* and *Advanced Military Cryptography*. He went on to write an expanded, four-volume course on military codes and ciphers, *Military Cryptanalysis,* between 1938 and 1941. As the SIS's personnel strength began to rise, its training program grew commensurately. Finding its Munitions Building spaces too limited to accommodate a large influx of students, SIS began to use Friedman's textbooks as correspondence courses for army personnel outside Washington. Instruction in cryptography was deemed so important that, in July 1940, the Signal Corps added a one-week course in cryptography to the curriculum of its school at Fort Monmouth, New Jersey.

The SIS correspondence courses also were sent to American colleges and universities. Two students at Yale who took them were William Bundy, who would become assistant secretary at both the State and Defense Departments during the Kennedy and Johnson administrations, and William Kunstler, who later headed the American Civil Liberties Union and defended members of antiwar and civil rights groups during the 1960s and 1970s.[36] In the end, several hundred personnel, military and civilian, took these courses between 1939 and 1941, with at least 100 completing both *Elementary* and *Advanced Military Cryptography* and another 70 finishing at least the first volume of *Military Cryptanalysis.*[37]

The earliest recruits arriving in Washington after Pearl Harbor worked through Friedman's texts and completed training materials without an instructor, turning in their exercises to Stanley Kretlow for evaluation. Kretlow, an army sergeant with an aptitude for cryptanalysis who caught the attention of Abraham Sinkov, joined the SIS in 1939 and was assigned to the Signal Intelligence School. Around the time Akeley arrived in Washington, the first groups of civilian recruits began to report. As the spaces occupied by the SIS in the Munitions Building were overcrowded, Friedman obtained several classrooms at nearby George Washington University. Akeley was assigned to head up instruction there, with Kretlow evaluating the students' written exercises at the Munitions Building.[38]

The first months after Pearl Harbor were chaotic for the SIS, as they were for much of the

Evelyn Akeley (second from left) and others meeting at Arlington Hall, 1946. Cryptanalyst Wilma Berryman is seated next to Akeley. Courtesy staff historian, US Army Intelligence and Security Command, Ft. Belvoir

American war effort while the Roosevelt administration mobilized the nation's defense capabilities. That chaos is reflected in the recollections of one of Akeley's first students, Ann Caracristi. Caracristi, who four decades later would retire from the top civilian position at the SIS's peacetime successor, the National Security Agency, recalled her experience in Akeley's class as illustrating just how much "everyone was playing it by ear." "We all learned," she recalled, "that she [Akeley] was exactly one lesson ahead of the rest of us."[39]

The number of civilians coming to Washington to support the army's codebreaking efforts rose significantly over the summer of 1942, reaching 500 by August. The influx then leveled off, and a few months of stability followed. Then, starting in December, came a massive onrush of new arrivals, taking an organization that numbered around 1,700 to over 7,000 just six months later. At the height of this buildup, January and February 1943, over 150 civilians and roughly the same number of military personnel were arriving every week.[40]

Akeley's classes soon outgrew their George Washington University spaces. Earlier in 1942, recognizing that its Munitions Building spaces,

inadequate even before the war, would soon be overwhelmed by the growing numbers of personnel, the SIS began looking for a location for a new facility. There were two main requirements: sufficient room to accommodate substantial growth and proximity to Warrenton, Virginia, where the army operated a site for intercepting long-distance foreign communications. Returning to Washington from a visit to Warrenton, two SIS officers noticed a small women's college, Arlington Hall, which was experiencing financial difficulties. The army purchased Arlington Hall in March and immediately began renovating its main building. To provide office space for the influx, construction began on two large buildings that would be known as Operations Buildings A and B. Ground was broken for the first building in August, with the first groups of cryptanalysts moving in in late November. Construction on the second building started immediately thereafter.

Akeley and her students moved to Arlington Hall in late August 1942, two months after the SIS had moved its first elements there from the Munitions Building. Akeley was named director of training, although the title apparently remained an informal one due to army regulations, and was given office and classroom space on Arlington Hall's third floor. Her endeavor became the SIS Training School and moved to the basement and other spaces (later in the war these housed a cafeteria).[41] A separate program that offered Japanese language instruction was established by Harvard University professor Edwin O. Reischauer.[42]

In early 1943, the burgeoning SIS was renamed the Signal Security Agency. Hundreds of new employees were arriving at Arlington Hall every week, each in need of training. Some were allowed to take classes at the school while awaiting their security clearances. The monthly enrollment during this period averaged 750. Akeley's small cadre of instructors taught for eight hours a day, but their organization still lacked any official status. The SSA's new leader, Signal Corps colonel Preston Corderman, who in the mid-1930s had enough familiarity with cryptanalysis to teach at the SIS school, opted to formalize these training efforts. To lead them, he designated another longtime codebreaker, Frank Rowlett, who prior to joining Friedman at the SIS in 1930 had taught high school mathematics. Unlike Akeley, but as was the case with the chiefs of all other major components at Arlington Hall, Rowlett was male and held an army commission.[43]

A one-month introductory curriculum was established that included two weeks of general training in cryptanalysis and two weeks geared to the employee's specific assignment, along with orientation lectures on life at Arlington Hall. Subsequent work assignments were determined by a combination of classroom performance, aptitude, and current operational needs. Many employees were directed into those offices working Japanese Army traffic, with others heading for offices attempting to break the codes and ciphers of Axis satellite nations and neutrals. In March 1943, the school moved to Operations Building B.[44]

By August 1943, the surge in recruitment began to abate, lowering the demand on the school. Akeley and some other members of the teaching staff were reassigned to operational components.[45] This did not end her involvement in training of new personnel arriving at Arlington Hall, however. In September, Solomon Kullback asked her to assist five other Arlington Hall women—Mildred Lowrance, Olivia Fulghum, Alice Beardwood, Elizabeth Hudson, and Juanita Schroeder—in designing a course for all recruits earmarked for the Japanese Army Code Section, a course that was still in use two years later as the end of the war approached.[46]

Moving Up … and Becoming a Codebreaker

By late 1943, Akeley's responsibilities turned to actual breaking of enemy codes. By June 1944, she was working in the research element of Arlington Hall's effort against Japanese Army codes, its largest component, as its deputy under Dr. C. R. Cassity. This element studied new cryptographic systems as they were introduced by the Japanese. One project it worked on during Akeley's tenure was how to decipher a discriminant, or a group of numbers at the beginning of encrypted messages that indicated to a code clerk at the Japanese Army unit receiving an encrypted message the specific system that the sending unit had used to encode it. Early in the war, the Japanese had sent discriminants in the clear, or unencoded, but they began to encrypt them as the conflict dragged on and Tokyo realized that the repeated use of its codes might be a vulnerability. Another project that Akeley's research team took on was analysis of messages sent by the Green machine, a new device that the Japanese Army had developed toward the end of the war but never put into operation. Akeley was still with this group as of early 1945, heading its Special Projects units. She presumably was in this position when atomic bombs were dropped on Hiroshima and Nagasaki, prompting Japan to surrender and ending World War II. [47]

Later Career and Retirement

With the conclusion of hostilities, Akeley remained at Arlington Hall after World War II as a cryptanalyst. She was promoted to Grade 13 in January 1953, by which time the wartime Signal Security Agency had become NSA, and as of early 1955 was the sixth most senior woman at that grade. [48]

Akeley retired from NSA in May 1958. She moved to Winter Park, Florida, took up golf, and settled into a house on a pond with a boat dock. She developed a passion for ocean cruises; one she took on the S.S. *President Monroe* lasted over three months and took her around the world. She renewed her interest in music, playing cello and violin and studying viola at Rollins College. She also sang in local choral groups. She moved to Sarasota and in 1973 toured Eastern Europe with the Florida West Coast Symphony as a violist. By 1981, Akeley had moved to the Plymouth Harbor retirement home in Sarasota, where her Skidmore colleague, Marion Pease, was living. [49] Two decades later, on March 28, 1998, Akeley passed away at the age of 90. [50] Her legacy lives on in her successful code instruction that helped shorten a world war and in her pupil Ann Caracristi, later deputy director of the National Security Agency.

David Sherman was head of the Strategy, Plans, and Policy organization for the National Security Agency before his retirement in 2017.

Notes

1. In September 1944, Thomas E. Dewey, governor of New York and the Republican candidate for president against Franklin Roosevelt, learned that the army had broken the Japanese "Purple" diplomatic code prior to Pearl Harbor and was considering using it to discredit Roosevelt by implying, incorrectly, that the president knowingly left Hawaii open to attack in order to take an unwitting but unified American public into World War II. Marshall, rightly fearing the revelation of US codebreaking capabilities would lead the Japanese to change their encryption systems and thus deny the Allies vital intelligence, successfully persuaded Dewey not to go public with his charges by pointing to just how crucial these capabilities were for ongoing military operations. "The conduct of General Eisenhower's campaign [in Europe]," Marshall wrote, "and of all operations in the Pacific are closely related in conception and timing to the information we secretly obtain through these intercepted codes. They contribute greatly to the victory and tremendously to the saving in American lives, both in the conduct of current operations and in looking towards the early termination of the war." *The Papers of George Catlett Marshall,* vol. 4*, "Aggressive and Determined Leadership," June 1, 1943-December 31, 1944* (Baltimore and London: Johns Hopkins University Press, 1996), 607-11.

2. For the date of Evelyn's birth, see the NSA William F. Friedman Collection, Document A72402, 11, https://www.nsa.gov/Portals/75/documents/news-features/declassified-documents/friedman-documents/reports-research/FOLDER_041/41718869075816.pdf. A 1998 obituary lists her only surviving relative as a cousin, presumably the child of one of Albert or Julia's siblings.

3. Thomas Corwin Mendenhall, *Chance and Change in Smith College's First Century* (Northampton, MA: Smith College, 1976), 22-23; and Helen Lefkowitz Horowitz, *Alma Mater: Design and Experience in the Women's Colleges from Their Nineteenth Century Beginnings to the 1930s*, 2nd ed. (Amherst: University of Massachusetts Press, 1993), 213, 314.

4. Mendenhall, 26-27.

5. Mendenhall, 7. The number of mathematics majors at Smith likely was quite small at the time Akeley attended the college but still larger than at many comparable institutions.

6. A biographical sketch of Edgerton can be found at Agnes Scott College's "Biographies of Women Mathematicians" project, https://www.agnesscott.edu/lriddle/women/merrill.htm.

7. Although Yale did not become a coeducational undergraduate institution until 1969, it admitted women as graduate students starting in 1892.

8. For Wood's biography, see https://www.agnesscott.edu/lriddle/women/wood.htm.

9. For Benedict's biography, see https://www.agnesscott.edu/lriddle/women/benedict.htm.

10. For Rambo's biography, see Judy Green and Jean LaDuke, *Pioneering Women in American Mathematics: the Pre-1940 Ph.D.s* (Providence, RI: American Mathematical Society, 2009).

11. For Anderton's biography, see Green and LaDuke, *Pioneering Women in American Mathematics*, 125.

12. Smith College Class of 1928 Yearbook, 176, 178, 208, 215, 232, and 233, http://www.e-yearbook.com/sp/eybb?school=66&year=1928.

13. *Smith Alumnae Quarterly*, November 1928, 130; July 1929, 558; and May 1930, 590, https://alumnae.smith.edu/saq/archive/. Washington Female Seminary offered college preparatory courses for young women as well as instruction in art and music. It closed in 1948 and was purchased by Washington and Jefferson College. See Tori Harding-Smith, "Four Important Moments in the History of Washington and Jefferson College," Washington and Jefferson College website, http://www.washjeff.edu/four-important-moments. On the nineteenth-century female seminary movement, see Irene Harwarth, Mindi Maline, and Elizabeth DeBra, *Women's Colleges in the United States: History, Issues, and Challenges* (Washington, DC: Department of Education, 1997), 1-2.

14. Skidmore College Archives. On Evelyn's appointment as an instructor of mathematics and physics at Skidmore, see *Skidmore News*, September 30, 1931, 1, http://digitalcoll.skidmore.edu/cdm/landingpage/collection/p15968coll1. On her appointment becoming permanent, see *Skidmore College Bulletin, 1933-34; Report of the President, 1932-33*, September 1933, 1, http://

digitalcoll.skidmore.edu/cdm/compound
object/collection/p15968coll11/id/3745/rec/2.
For her promotion to assistant professor, see
*Skidmore College Bulletin, 1935-36; Report of
the President, 1934-35*, September 1935, 13,
http://digitalcoll.skidmore.edu/cdm/compound
object/collection/p15968coll11/id/3805/rec/4.
Akeley's parents first lived at 137 Circular Street;
by 1934 the family had moved to 253 Nelson
Avenue. Albert Niemann died in 1951; *New York
Times*, November 21, 1951, 25.

15. Elaine Kendall, *Peculiar Institutions: An Informal
History of the Seven Sister Colleges* (New York: Put-
nam, 1975), 193.

16. Mary C. Lynn, *Make No Small Plans: A History
of Skidmore College* (Saratoga Springs, NY: Skid-
more College, 2000), 92-101; Skidmore College
Archives.

17. "Evelyn Niemann to Wed: Troth of Saratoga Springs
Girl Made Known by Parents," *New York Times*,
November 1, 1934, 26; *Smith Alumnae Quarter-
ly*, February 1935, p. 215; and August 1935, 454;
and *Skidmore College Bulletin, 1935-36; Report
of the President, 1934-35*, September 1935, 13,
http://digitalcoll.skidmore.edu/cdm/compound
object/collection/p15968coll11/id/3805/rec/4.
See also "The April Meeting In New York," *Bulletin
of the American Mathematical Society*, 42/1 (1936),
449-50, http://www.ams.org/journals/bull/1936-
42-07/S0002-9904-1936-06310-X/S0002-9904-
1936-06310-X.pdf.

18. Skidmore College Archives; *Bulletin No. 6* (Prince-
ton, NJ: The Institute for Advanced Study,
1937), https://library.ias.edu/files/pdfs/bulletins/
Bulletin6.pdf.

19. *Skidmore News*, October 14, 1937, 5. While vis-
iting Austria in either 1938 or 1939, Edward met
and proposed to Anna Frost, who had studied
physics but because she was Jewish was forced to
leave her university when the Nazis came to pow-
er in Vienna. With assistance of the anti-Hitler
underground, Frost escaped Europe via the Soviet
Union and Japanese-occupied Korea and made her
way to the United States; she and Edward married
in 1942. Kyle Boggs, "Holocaust Survivor Pub-
lishes Memoirs, Traces Life," *The Purdue Exponent*,

May 16, 2001, https://www.purdueexponent.org/
features/article_32be5bce-c98e-5897-8e06-
9bb95899515f.html; Steve Weiss and Samuel Har-
ris, "'Just a Simple Physics Teacher' Looks Back
on Her Career," Purdue University Department
of Physics and Astronomy website, http://www.
physics.purdue.edu/about/prizes_awards/akeley.
html.

20. *Skidmore News*, April 28, 1939, 6; May 14, 1938, 3;
May 3, 1939, 1; October 11, 1939; October 25, 1939,
1; January 10, 1940, 3; and January 17, 1940, 1.

21. *The Saratogian*, February 14, 1941, 5; Skidmore
College Archives.

22. *Skidmore News*, November 8, 1939, 1; December 6,
1939; February 21, 1940; Skidmore College Archives.

23. "In 1939…the NYA was retooled to train youth
to work in industries to national defense. Riding
piggyback on the war effort, the NYA expired in
the very midst of the fighting." Richard A. Rei-
man, *The New Deal and American Youth: Ideas
and Ideals in a Depression Decade* (Athens: Uni-
versity of Georgia Press, 1992), 8. On the NYA's
founding, in which Eleanor Roosevelt played
a pivotal role, see Blanche Wiesen Cook, *Elea-
nor Roosevelt: The Defining Years, vol. 2, 1933-
1938* (New York: Viking/Penguin, 1999), 268-
72. When full employment was reached after
America's entry into World War II, the president
terminated the NYA as unnecessary (Skidmore
College Archives).

24. Jean Poskanzer Rudnick, oral history, Skidmore
College Oral History Collection (May 9, 1966), 1-2,
http://digitalcoll.skidmore.edu/cdm/singleitem/
collection/p15968coll6/id/198/rec/23. See also
"Call to Service: War-Years Alumna Arranges Major
Support for Skidmore," *Skidmore Scope*, Fall 2001,
https://www.skidmore.edu/scope/fall2001/alumni/
service.html.

25. Lynn, *Make No Small Plans*, 159.

26. Akeley's participation in the conference is docu-
mented in the Skidmore College Archives. See also:
Institute of Women's Professional Relations, *War
Demands for Trained Personnel: Proceedings of the
Conference Held at the Mayflower Hotel, Washing-
ton, D.C.* (New London, CT: Institute for Wom-
en's Professional Relations, 1942), v.

27. Institute of Women's Professional Relations, *War Demands*, 32.

28. Institute of Women's Professional Relations, *War Demands*, 8.

29. Institute of Women's Professional Relations, *War Demands*, 221.

30. Kullback and Sinkov were in the inaugural group of individuals inducted into the National Security Agency's Cryptologic Hall of Honor in 1999. For Kullback's Hall of Honor biography, see https://www.nsa.gov/History/Cryptologic-History/Historical-Figures/Historical-Figures-View/Article/1623043/dr-solomon-kullback/; for Sinkov's, see https://www.nsa.gov/History/Cryptologic-History/Historical-Figures/Historical-Figures-View/Article/1623039/dr-abraham-sinkov/.

31. Lynn, *Make No Small Plans,* 164.

32. Lynn, *Make No Small Plans*, 164.

33. Lynn, *Make No Small Plans*, 165, 167; Proskanzer oral history, 2.

34. *History of the Signal Security Agency, Volume 1, Part 1: Organization 1939-1945* (Washington, DC: Army Security Agency, 1938), 73-74. See also John Hurt, "A Version of the Japanese Problem in the Signal Intelligence Service, 1930-1945" (Washington, DC: Army Security Agency, n.d.), 26-27, NSA Friedman Collection, Document A58132.

35. The school appears to have been formed at the direction of Major Haskell Allison, who succeeded Friedman as head of the SIS in August 1935 in a reorganization that placed a military officer in charge and allowed Friedman to focus exclusively on codebreaking activities, with administration and training handled in a separate organization. See *History of the Signal Security Agency, Volume 1, Part 1*, 11-12. See also *History of Training in the Signal Security Agency and the Training Branch* (Washington, DC: Signal Security Agency, 1945), 5-6. Available at the National Cryptologic Museum Library, Fort George G. Meade, Maryland, as Special Research History 358.

36. Kai Bird, *The Color of Truth: McGeorge Bundy and William Bundy, Brothers in Arms* (New York: Simon and Schuster, 1998), 65. Drafted into the army in the summer of 1941, William Bundy was assigned to the Signal Corps school, where he first studied and later taught cryptanalysis.

37. *History of the Signal Security Agency, Volume 1, Part 1*, 62-69; and *History of Training in the Signal Security Agency*, 4-8.

38. *History of Training in the Signal Security Agency*, 9. On Kretlow, see also Hurt, "A Version of the Japanese Problem," 8.

39. Ann Caracristi, interview by Robert D. Farley, NSA-OH-15-82 (July 16, 1982), 4, https://media.defense.gov/2021/Jul/15/2002763429/-1/-1/0/NSA-OH-15-82-CARACRISTI.PDF.

40. *History of the Signal Security Agency, Volume 1, Part 1*, personnel strength charts following 150. Significant numbers of military personnel ultimately would be transferred overseas or to other domestic facilities.

41. *History of the Signal Security Agency, Volume 1, Part 1*, 165.

42. Edwin O. Reischauer, *My Life Between Japan and America* (New York: Harper Collins, 1986), 91-94.

43. *History of the Signal Security Agency, Volume 1, Part 1*, 165-7.

44. *History of the Signal Security Agency, Volume 1, Part 1*, 165-7.

45. *History of the Signal Security Agency, Volume 1, Part 1*, 167.

46. Liza Mundy, *Code Girls: The Untold Story of the American Women Code Breakers of World War II* (New York: Hachette, 2017), 247-8.

47. *History of the Signal Security Agency, Volume 3: The Japanese Army Problem–Cryptanalysis, 1942-1945* (Washington, DC: Army Security Agency, 1945), 37-45.

48. NSA Civilian Personnel Lists, NSA Friedman Collection, Documents A71825 and A72402.

49. *Smith College Alumni Quarterly*, February 1960, 108; November 1963, 51; February 1968, 38; April 1974, 40. Marion Pease, oral history, Skidmore College (March 24, 1981), http://digitalcoll.skidmore.edu/cdm/compoundobject/collection/p15968coll6/id/165/rec/21.

50. Phoenix Society Newsletter, June 1998. National Cryptologic Museum Library, Fort George G. Meade, MD. (The Phoenix Society is an association of NSA retirees.)

Pulling Back the Curtain:
NSA's 50-Year Path to Transparency

Sarah Parsons

"Transparency—We are committed to fostering public understanding of NSA's mission and to providing complete transparency to those who authorize and oversee NSA's work on behalf of the American people."[1] Of all the core values of the National Security Agency (NSA), the concept of transparency might be the one that has had the most dramatic evolution over time. After all, NSA has famously been "one of the most secret (and secretive) members of the U.S. Intelligence Community."[2] One former NSA official stated in the 1980s that, "particularly where we reveal success of our effort, it should continue to be classified forever."[3] For many decades, the intelligence story, in the words of intelligence historian Dr. Michael Warner, "desperately did not want to be told."[4]

But told it was. The year 2022 marks 50 years since a presidential executive order (EO) outlined specific time-based procedures for the regular and automatic declassification of government records, to include those dealing with communications intelligence and cryptology. Issued by President Richard M. Nixon in 1972, EO 11652, "Classification and Declassification of National Security Information and Material," pushed NSA into the world of declassification. No fewer than five EOs have been issued by subsequent presidential administrations; the current order is EO 13526, "Classified National Security Information," as amended, issued by President Barack Obama in 2009. With each new EO issued in reaction to world events, national security priorities, and political climates, the pendulum of transparency has shifted back and forth, and the public debate on government secrecy has matured. This article looks back at NSA's path toward greater openness and transparency.

Like other Intelligence Community (IC) agencies, NSA had to adapt to the changing policies. Along the way, it grappled with following both the letter and the spirit of the EOs. In the 1970s, NSA cobbled together an office in response to the new declassification mandates. Today, declassification review of NSA's historic and classified information is done routinely by a well-established Declassification Services Division within an office responsible for Agency information management functions.

Secrecy, protected in the form of classified records, plays an essential role in national security missions and operations. The founder of American cryptology, William Friedman, once said, "if you can't use the information without arousing the enemy's suspicion as to its origin,

what good is it except, perhaps, for historical purposes?"[5] He knew far too well what could have happened in war if the enemy had learned that the United States and its allies had broken into diplomatic and military encryption systems. The enemy would have changed enciphering methods and extinguished decryption efforts based on months of work by American codebreakers—possibly resulting in a longer, costlier, and deadlier war. Protecting sources and methods, as well as operational successes and failures, is critical to maintaining national security. In some rare circumstances, that information may have long, complex histories with present-day consequences if revealed prematurely.[6]

However, like cryptology itself, which involves both analysis of enemy encryption systems and protection of one's own, there are two sides to this coin. In a democratic republic, public trust in the institutions of government is equally as important as national security. And to have trust, the public must have knowledge. Keeping citizens and their elected representatives informed of the actions, decisions, and history of their government (even the missteps) is essential in a healthy democracy. The Public Interest Declassification Board, a National Archives and Records Administration (NARA) advisory group established in 2000, stated that, "without such an understanding [of history], the public cannot know which candidates to vote for or which policies to support. They cannot judge the best course for the country. Without historic understanding, the mistakes of the past are destined to be repeated; the triumphs, unappreciated."[7]

President Harry S. Truman issued the first presidential EO to tackle government-wide declassification policies and procedures in 1951: EO 10290, "Prescribing Regulations Establishing Minimum Standards for the Classification, Transmission, and Handling, by Departments and Agencies of the Executive Branch, of Official Information which Requires Safeguarding in the Interest of Security of the United States." Worded as merely a suggestion, it instructed agency heads to consider declassification "as soon as conditions warrant."[8] This was issued in the year prior to NSA's establishment, but even its predecessor, the Armed Forces Security Agency, undertook no serious steps to declassify records that revealed its activity. Subsequent EOs from President Dwight D. Eisenhower, then, as amended by President John F. Kennedy, went a bit further but also called out material requiring special handling, such as cryptography, as exempted from automatic declassification—effectively exempting any records produced by NSA.[9]

Nevertheless, throughout the 1960s, NSA's secret mission was getting out one way or another through literary and newspaper exposés, congressional investigations into intelligence failures, as well as spies, defectors, and leaks, or a combination thereof; all of which were rolled up into the category of unauthorized disclosures.[10] Such disclosures often painted NSA in a negative light. After all, exposés tend to sell, Congress rarely investigated intelligence successes, and disgruntled employees sometimes had an ax to grind. Additionally, with the absence of primary source records from the Agency, the public had no ability to understand the full picture. As a result, the average American in the 1970s knew little of the positive achievements of the nation's cryptologists, intelligence analysts, and other civil servants who had kept the nation safe during both world wars and protected it from being "vaporized in a cloud of radioactive ash"[11] in the years since.

In this vein, some at NSA began to look back on their past and see the issue of declassification differently. In his 1969 article titled, "History Awaits; Who Will Write It?" Edwin Fishel, editor of the internal NSA journal *Cryptologic Spectrum* (a precursor of *Cryptologic Quarterly*), wrote "Will our contribution to World War II present

a captivating story for future generations or will it go into oblivion? The answer depends on us." Fishel explained that NSA needed to think about building an image for itself outside the cryptologic community and that it should look to its own history to do so. He said, "Our public image is dependent on history as old as the First World War and older, except in those cases, such as Pearl Harbor, where our story gets into the public domain through initiatives other than our own."[12] Here he was referring to historic examples such as the congressional hearings on the Pearl Harbor attack that revealed cryptanalytic success against the Japanese diplomatic encryption system.[13]

A few months later, Fishel again argued that the Agency should consider releasing classified historical information because "history is Intelligence's only defense against an uninformed and none-too-friendly public opinion. The American people are congenitally distrustful of secret activities. That is a healthy way to be, but it should not be, as it is now, an uninformed distrust. The public has never known the extent to which our national existence or safety—from the day Saratoga was fought to today—has depended on intelligence. That is a dangerous kind of ignorance."[14]

Granted, some cryptologic history was already in the public domain. Two years earlier, journalist David Kahn produced a colossal narrative on the history of cryptology, starting with ancient times and attempting to describe cryptology into the present day, but it fell short of the details post World War I because the details remained classified. Even so, Kahn's *The Codebreakers: The Story of Secret Writing* threw NSA officials for a loop. Even though the study and application of codes and ciphers had been known for centuries, NSA was not keen on publicizing this history and cryptologic knowledge with the public.[15]

Two pieces of legislation laid the groundwork for NSA's future declassification program: the 1950 Federal Records Act and the 1966 Freedom
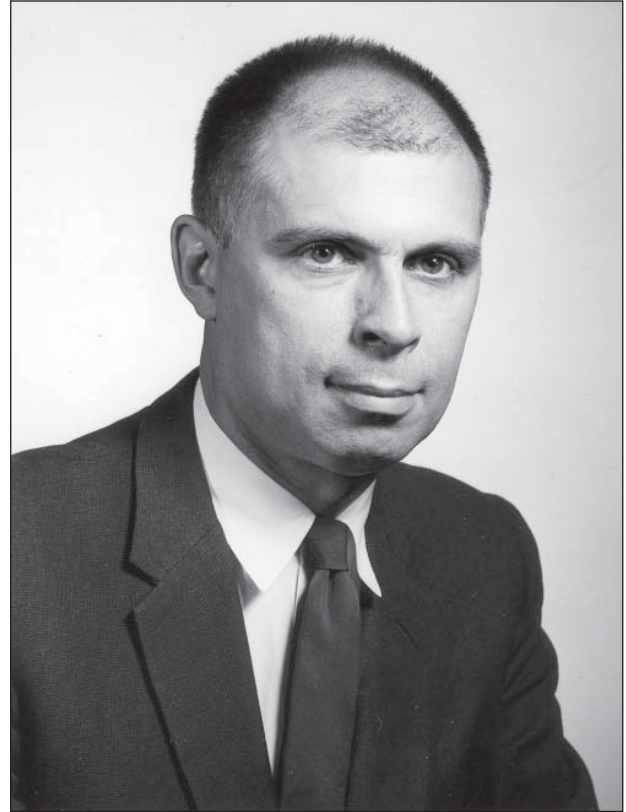
Edwin Fishel, editor of the former NSA journal *Cryptologic Spectrum.* NSA photo

of Information Act (FOIA, first enacted in 1967). The Federal Records Act required agencies to create records to document their policies, decisions, activities, and functions and required specific retention and disposition rules to manage those records. This ensured the timely and appropriate destruction of temporary records and the preservation of permanent records, defined as those that held historic value and significance. The FOIA was the result of 12 years of determination by Congressman John E. Moss and provided the legal basis for the public's right to know the activities of their government.[16] This legislation was rooted in the premise that had been articulated over 140 years earlier by James Madison that "a popular Government, without popular information or the means of acquiring it, is but a Prologue to a Farce

or a Tragedy; or perhaps both. Knowledge will forever govern ignorance; And a people who mean to be their own Governors, must arm themselves with the power which knowledge gives."[17] While classified information pertaining to foreign affairs and the military was generally exempted from the FOIA, the law nonetheless planted a seed for government openness that would ultimately push NSA toward greater transparency.

Still, classification of military information had strong roots. Originating in the nineteenth century in the form of US Army and Navy regulations documented in operating manuals, its use expanded during World War I when the American military began to mirror information security methods used by their ally Great Britain. Military secrecy grew to epic proportions during World War II when the military cryptologic organizations (forerunners of NSA), Office of Strategic Services (OSS, forerunner of the Central Intelligence Agency), and the Federal Bureau of Investigation played vital roles in the victory over the Axis powers. The conclusion of the war did not bring an end to international threats. As the United States engaged in a Cold War with the Soviet Union, the perceived need for tighter information security controls grew even stronger in the 1950s and 1960s. As a result, the information classification system became more controlled, routinized, bureaucratized, and enforced.[18]

Beginning in 1951, presidential EOs were used to regulate the creation and use of classified information by executive branch agencies. Initially, the concept of declassification was but a fleeting side note in the first three EOs (President Truman's 1951 EO 10290; President Eisenhower's 1953 EO 10501, "Safeguarding Official Information in the Interests of the Defense of the United States"; and President Kennedy's 1961 EO 10964, "Amendment of Executive Order No. 10501"), which defined the classification levels of Top Secret, Secret, and Confidential and stipu-

lated rules such as original classification authority and proper marking of documents.[19] The mention of declassification provided an opportunity for agency heads to declassify a document if they deemed it practicable but did not *require* declassification of cryptologic records. NSA's chief of Communications Security, Paul Neff, reviewed President Kennedy's EO 10964 in 1961 for potential impact on the Agency, but determined that the EO was written in such a way that virtually all records maintained and produced by NSA safely fell into a category stipulated as exempted from automatic declassification.[20]

The person responsible for giving some strength to declassification programs was none other than President Nixon, who, two years after issuing EO 11652, resigned amid allegations of political spying and cover-ups collectively referred to as the Watergate scandal. Before this imbroglio, the roots of President Nixon's distrust of the Central Intelligence Agency, in particular, ran deep.[21] It has been suggested that his motivation to force the declassification program on the IC was partly to reveal potentially embarrassing records of the preceding administration.[22] In January 1971, he established an interagency review committee to study the government's security classification procedures and make recommendations on their improvement, especially with regards to declassification and greater openness in government. EO 11652, issued on March 8, 1972, treaded lightly when compared to present-day declassification rules. However, for the first time, it stressed the importance of balancing the release of information to the public with the requirement to keep critical national security information protected for the United States and its allies.

EO 11652 outlined an automatic declassification schedule for downgrading classified information to lower levels at specific yearly intervals. It also stipulated that all existing classified information would be automatically declassified after 30

years, unless the head of the department assigned responsibility for the information could articulate the danger if released.[23] In addition, EO 11652 stated that unnecessary classification and over-classification would be prohibited and "in no case shall information be classified in order to conceal inefficiency or administrative error, to prevent embarrassment to a person or a Department, to restrain competition or independent initiative, or to prevent for any other reason the release of information which does not require protection in the interest of national security."[24] Even though some might argue that the Nixon EO was weak and provided no substantial incentive for agencies to declassify, it was still a major reversal from previous EOs. From this point forward, the burden was placed on agencies to provide evidence of the need to preserve secrecy.

In April 1972, the archivist of the United States (AOTUS) and the head of the National Archives and Records Service (NARS, today known as NARA) sent a notice to NSA's director (DIRNSA) Vice Admiral Noel Gayler, USN, making Gayler aware of the new EO and stating his commitment to it. He informed DIRNSA that NARS's "holdings of pre-1943 classified material comprise approximately 58,000,000 pages, representing an estimated 95% of all classified records for that period."[25] In addition, AOTUS requested a representative from NSA to act as a liaison to the declassification effort. Deputy Director Dr. Louis Tordella, writing on behalf of Admiral Gayler, acknowledged the responsibilities of NARS and identified a member of his policy coordination staff as a liaison. What he did not tell AOTUS was that approximately five weeks earlier, almost as soon as the Nixon EO was published, NSA General Counsel Roy Banner had analyzed the EO as it pertained to NSA records. Quickly providing his assessment to DIRNSA, Banner acknowledged that the EO "could impose administrative burdens upon NSA." For example,

it required Agency employees to portion mark their documents at every paragraph and section heading, in addition to including the standard classification banner marking at the top and bottom of every page. NSA's general counsel felt this requirement would be "clearly impracticable" given the volume of classified information produced at NSA—a statement that time has proven to be false.[26]

Attention on the matter soon took a back seat to more pressing problems, like the public uproar over government secrecy and IC practices triggered by the Watergate scandal. Simultaneously, the public disclosures of NSA continued. In August 1972, *Ramparts* magazine published an exposé featuring a former NSA analyst under the pseudonym Winslow Peck. In 1974, Frederick Winterbotham's *The Ultra Secret* became the first major English-language publication to reveal the success of Allied cryptanalytic work against the World War II German Enigma machine.

The proverbial cat was out of the bag. One professor from the US Army War College (and an OSS veteran from World War II) remarked that there was no longer much point in holding back any "nontechnical data" on World War II ULTRA intelligence. However, he acknowledged that "some will always lament that the seal was ever broken and predict that the lepidoptera emerging from what they conceive to be a Pandora's box will yet do mischief."[27]

What did the NSA workforce think about the 1970s declassification initiatives? It is difficult to determine as records do not provide a complete picture. But in November 1973, Director of Central Intelligence William E. Colby delivered an address to the NSA workforce during Security Week, which revealed his opinion on the matter. There he said, "Our secrets are not ours; they belong to the country and the country through its leaders. …We have to accept the fact that we are going to operate under an authority which

has the right to reveal to the people of the United States, for good reason, some of the things that we gathered, analyzed and produced under the most stringent security regulations."[28] Colby reminded the workforce that "we serve the people through the executive, through the Congress, through the judiciary, and even through the fourth estate, the press, but it is the people that we are really serving. We are not serving only one part of this total American country of ours." Finally, he explained how "in the area of secrecy, we have to respect the necessities of secrecy, particularly in intelligence. We obviously are in a different business than the Fish and Wildlife Service or some of the other services. Nonetheless, underneath it we have to remember that we are in the *American* intelligence service, and that we consequently have to have an American approach to the problem of secrecy. We must be more open. It will be more difficult for us to serve the people, but it is also going to be much more rewarding"[29]—prophetic statements for what would come in the following decades.

Eventually, as a result of EO 11652 and the realization that fighting its requirements and the requirements of FOIA would be futile, NSA's next DIRNSA, Lieutenant General Lew Allen, USAF, established the NSA declassification program in 1975. The program began with one full-time employee and two part-time, re-employed annuitants (REAs, or retired NSA employees). Their charge was to review all records that were 30 years old or older. The massive volume of work needed to be prioritized, so a decision was made to focus on four special topics: US signals intelligence (SIGINT) histories and US SIGINT of World War II, SIGINT from World War I and the interwar period, the Korean War, and the Vietnam War.[30] NSA and the Department of Defense came to these decisions through close collaboration with their Government Communications Headquarters partners in the United Kingdom because so many of the cryptologic programs and activities since World War II were intertwined.[31]

At the time, records of World War II seemed to be the most likely declassifiable and of highest public interest. The first declassification initiatives were deliberate, purposeful, and strategic. Documents and records were organized into special research (SR) categories:

> SR – Translations of Japanese Army messages
>
> SRA – Translations of Japanese military attaché messages
>
> SRDG – Translations of German diplomatic messages
>
> SRDJ – Translations of Japanese diplomatic messages
>
> SRF – Translations of Japanese Air messages
>
> SRGL – Translations of German Navy Liaison Berlin/Tokyo messages
>
> SRGN – Translations of German U-boat messages
>
> SRN – Translations of Japanese Navy messages
>
> SRNA – Translations of Japanese Naval attaché messages
>
> SRNM – Radio Intelligence messages
>
> SRR – Translations of Japanese Water Transport code messages
>
> SRS – Magic diplomatic and Magic Far East summaries
>
> SRNS – Japanese Naval Radio Intelligence summaries
>
> SRH – Histories (written by the Army Signal Security Agency and later, the Army Security Agency)
>
> SRQ – Unclassified technical documents[32]

The program was housed in the NSA Records Center, which had been built in 1966 to hold records until their disposition date (i.e., the date on which records deemed temporary are destroyed, and records deemed permanent are preserved within an archive), in accordance with records management timelines. With the new declassification mandate, NSA's next director,

Help Wanted

Position: Immediate openings for persons to review for declassification purposes U.S. cryptologic records of the past 60+ years. *Qualifications:* Persons with past cryptologic experience, preferably WW II vintage, who possess long and excellent memories and are willing to plow through approximately 10-20 million records. Must have strong hands for opening boxes and good eyesight for hours of reading. *Contract:* One year, with option for renewal. *Fringe benefits:* Excellent—shorter work week, friendly atmosphere.

Help wanted notice from NSA's publication *Cryptologic Spectrum,* Winter 1980

Vice Admiral Bobby Ray Inman, USN, established a Cryptologic Archival Holding Area within the Records Center to hold historically significant, permanent, and still classified documents until they could be reviewed for declassification.[33] The volume of documents to review was enormous, so the Agency increased its number of REAs and also placed a help wanted advertisement in an internal publication.[34]

These early efforts bore fruit in 1981 when NSA collaborated with the Smithsonian Institution to curate a trailblazing exhibit on historic US cipher machines from the World War I and World War II eras. During the opening ceremony, Admiral Inman said, "We have been slowly trying to tred [*sic*] our way in these last three years to find some means by which this very sensitive Agency could put forward a public face. … With your kind support, we have great confidence that in this case we're taking a very positive strong step forward. There will be no need to take one back,

and we hope this is indeed the forerunner of the ability over the years ahead to make available to the public more of the contributions to this whole society which a very brilliant group of people have made."[35] Two such brilliant people, World War II cryptologic veterans Frank Rowlett and then NSA Deputy Director Ann Caracristi, stood by Admiral Inman's side as he made the remarks.

The Declassification Service Division continued to review and release records throughout the 1980s, giving a new generation of NSA employees something their predecessors never had: the ability to talk to their family and friends about the history and origins of the Agency. By the early 1990s, with the dissolution of the Soviet Union and perceived ending of the Cold War, the time seemed right to open a museum of cryptologic artifacts. The notion was enticing to many, especially those in the Agency's Public Affairs Office, who had been endeavoring to tell NSA's story. The Agency had been saving some representative

Frank Rowlett showing the United States' World War II era cipher machine, SIGABA, to NSA Director Vice Admiral Bobby Ray Inman and NSA Deputy Director Ann Caracristi in 1981 at the Smithsonian Institution. NSA photo

cryptologic machines and other artifacts since the end of World War II. Early architectural plans for NSA's first building on Fort Meade (known today as the William and Elizebeth Friedman Building, or OPS 1) had included a plan for an internal museum of sorts. The idea never fully matured, but over time erudite leaders with the Agency's technical cryptologic community acted as stewards and curators of the collection, displaying the cryptologic relics within their private offices. Then, in 1993 it finally happened: NSA opened a public museum. Years of declassification had allowed the Agency to display its history through exhibits, artifacts, and archival documentation.[36]

The NSA/CSS Records Center and Archives

The levee had broken. After the opening of the National Cryptologic Museum came NSA's arrival onto the World Wide Web, its active participation with the Government Secrecy Commission chaired by Senator Daniel Patrick Moynihan, and the bombshell release of the VENONA records, which revealed new insights into the extent of Soviet espionage during the early Cold War years.[37] Additionally, thanks to President William J. Clinton's trailblazing 1995 EO 12958, "Classified National Security Information," and numerous dogged FOIA requesters[38] who forced the Agency to confront the complexities and, at times, minutiae of declassification, thousands more records have been, and continue to be,

declassified and released to NARA where they wait to be mined by tenacious historians. In 2001, the *Baltimore Sun* printed a color photograph of NSA's inner sanctum: the NSA Archives, along with the headline, "Secret agency labors to release its secrets." Evoking popular culture references to the 1981 film *Indiana Jones: Raiders of the Lost Ark*, the article confirmed that a concerted declassification program was in place, patiently worked day in and day out by dedicated public servants.[39]

Pulling back the curtain of secrecy from historical classified records provides the public with rich sources that help inform our common understanding of the past. But even more than that, it can help inform an understanding of the present. In recent

years, NSA has been more open regarding today's critical cyber vulnerabilities, releasing information in order to deliver timely alerts to industry, academia, and the public.[40] This new era of cybersecurity transparency no doubt owes a debt of gratitude to the decades-long declassification effort that laid the foundation for the public's knowledge of NSA and its national security mission.

Moreover, when it comes to historical data and government records that have aged for 25 years or more and have no present-day security concerns, the trend toward openness is on track to continue. This is good news as informative histories have been published in the last 30 years by academics and independent scholars as a result of the declassification and FOIA programs. Arduous efforts to declassify large batches of topical records from significant historical events, programs, and officials have been a windfall to scholars. The Agency's declassification program, flanked by its sister divisions (Information Security and Classification, FOIA/Privacy Act, Records Management, and the Center for Cryptologic History), has become a steadfast pillar in NSA's core value of transparency. While it is a laborious, complex, and delicate balancing act to protect sources and methods *and* be open with the public, it remains an important mission and obligation.

Executive Orders Pertaining to the Classification and Declassification of National Security Information[41]

President Harry S. Truman: EO 10290, "Prescribing Regulations Establishing Minimum Standards for the Classification, Transmission, and Handling, by Departments and Agencies of the Executive Branch, of Official Information which Requires Safeguarding in the Interest of Security of the United States," September 27, 1951.

President Dwight D. Eisenhower: EO 10501, "Safeguarding Official Information in the Interests of the Defense of the United States," November 5, 1953.

President John F. Kennedy: EO 10964, "Amendment of Executive Order No. 10501," September 20, 1961.

President Richard Nixon: EO 11652, "Classification and Declassification of National Security Information and Material," March 8, 1972.

President Jimmy Carter: EO 12065, "National Security Information," June 28, 1978.

President Ronald Reagan: EO 12356, "National Security Information," April 2, 1982.

President William J. Clinton: EO 12958, "Classified National Security Information," April 17, 1995.

President George W. Bush: 13292, "Further Amendment to Executive Order No. 12958, as Amended, Classified National Security Information," March 25, 2003.

President Barack Obama: EO 13526, "Classified National Security Information," December 29, 2009.

Sarah Parsons is a historian with the National Security Agency's Center for Cryptologic History. Prior to that position, she was an archivist and records manager with NSA's Associate Directorate for Policy and Records. Before her government career, she worked in the nonprofit sector as a curator and archivist at the Baltimore and Ohio Railroad Museum and as the assistant director of the American Association of Museums' Information Center. She holds a BA in history from Salisbury University and an MA in public history from the University of Maryland, Baltimore County.

Notes

1. "Mission & Values," About Us, National Security Agency, accessed January 30, 2021, https://www.nsa.gov/Culture/Core-Values/.

2. Jeffrey T. Richelson, *The U.S. Intelligence Community* (Boulder, CO: Westview Press, 1995), 24.

3. Norman Boardman, interview by Robert Farley, January 17 and 29, 1986, NSA-OH-1986-03, transcript, CCH Oral History Collection, National Security Agency, Fort Meade, MD.

4. Michael Warner, *The Rise and Fall of Intelligence: An International Security History* (Washington, DC: Georgetown University Press, 2014), 3.

5. William F. Friedman, "The Influence of C-Power on History, Lecture No. 3, Making the Most of a Cryptologic Opportunity," September 8, 1958, William F. Friedman Collection of Official Papers, Document Reference ID A62864, accessed March 24, 2021, https://www.nsa.gov/Portals/70/documents/news-features/declassified-documents/friedman-documents/lectures-speeches/FOLDER_171/41758949079809.pdf.

6. David Sherman, "NSA Declassifies and Releases the Friedman Collection," April 30, 2015, Transforming Classification, Public Interest Declassification Board, accessed March 10, 2021, https://transforming-classification.blogs.archives.gov/2015/04/30/nsa-declassifies-and-releases-the-friedman-collection/.

7. Public Interest Declassification Board, *Improving Declassification: A Report to the President from the Public Interest Declassification Board*, December 2007, National Archives and Records Administration, accessed March 10, 2021, https://www.archives.gov/files/declassification/pidb/improving-declassification.pdf.

8. President Harry S. Truman, Executive Order 10290, "Prescribing Regulations Establishing Minimum Standards for the Classification, Transmission, and Handling, by Departments and Agencies of the Executive Branch, of Official Information Which Requires Safeguarding in the Interest of the Security of the United States," *Federal Register* 16, no. 188 (September 27, 1951): 9795, accessed March 10, 2021, https://fas.org/irp/offdocs/eo/eo-10290.pdf.

9. President Dwight D. Eisenhower, Executive Order 10501, "Safeguarding Official Information in the Interests of the Defense of the United States," November 5, 1953, accessed March 10, 2021, https://fas.org/irp/offdocs/eo10501.htm; President John F. Kennedy, Executive Order 10964, "Amendment of Executive Order No. 10501 Entitled 'Safeguarding Official Information in the Interests of the Defense of the United States'," September 20, 1961, accessed March 10, 2021, https://fas.org/irp/offdocs/EO10964.htm.

10. The first public disclosure of US government cryptologic activities was from a former cryptologist, Herbert O. Yardley, who published an exposé titled *The American Black Chamber* in 1931. Congressional investigations into the Pearl Harbor attack in the 1940s revealed aspects of the US military cryptanalytic capability. In the 1950s, NSA cryptanalyst Joseph Petersen made headlines when he was arrested for passing classified documents to a Dutch national. In the early 1960s, the Soviet shoot down of a U-2 spy airplane as well as the defection of former NSA employees William Martin and Bernon Mitchell to Moscow made headlines. Additionally, a congressional investigation into the 1968 North Korean attacks on the USS *Pueblo* and a naval EC-121 aircraft revealed aspects of US intelligence-gathering missions.

11. Stephen Budiansky, *Code Warriors: NSA's Codebreakers and the Secret Intelligence War Against the Soviet Union* (New York: Alfred A. Knopf, 2016), 309.

12. Edwin C. Fishel, "History Awaits: Who Will Write it?" *Cryptologic Spectrum* 1, no. 1 (Fall 1969): 36-38. See also Sarah Parsons, "Sources and Methods for Cryptologic History: NSA.gov—A Tour through its History and Resources," *Cryptologia* 44, no. 4 (2020).

13. Joint Committee on the Investigation of the Pearl Harbor Attack. *Pearl Harbor Attack: Hearings before the Joint Committee on the Investigation of the Pearl Harbor Attack*, 79th Congress, 1st session, Part 4, 1945.

14. Edwin C. Fishel, "History Awaits: Who Will Write it?"; "History Still Awaits—But Somewhat Less Patiently," *Cryptologic Spectrum* 1, no. 2 (Summer 1970): 37-38. See also Sarah Parsons, "Sourc-

es and Methods for Cryptologic History: NSA. gov—A Tour through its History and Resources."

15. Thomas R. Johnson, *American Cryptology During the Cold War, 1945-1989, Book II: Centralization Wins, 1960-1972* (Fort Meade, MD: National Security Agency, 1995), 473; David Hatch, "Cryptologic Almanac 50th Anniversary Series: No Such Agency," 2002, National Security Agency, accessed March 3, 2021, https://www.nsa.gov/Portals/70/documents/news-features/declassified-documents/crypto-almanac-50th/No_Such_Agency.pdf; David J. Sherman, "The Codebreakers' War: David Kahn, Macmillan, the Government and the Making of a Cryptologic History Masterpiece," paper presented at the 2019 Symposium on Cryptologic History, Laurel, MD. The Agency's desire to keep cryptologic information a secret would come to a pivotal juncture in the late 1970s when NSA attempted to shield important computerized data encryption methods from the public. Vice Admiral Bobby Ray Inman took the first steps when he began to engage more purposefully with the technical academic community. Today NSA has a robust public communications strategy for sharing critical cyber vulnerabilities with industry, academia, and the public.

16. John E. Moss was a congressman from California who advocated for the passage of the Freedom of Information Act in the 1960s.

17. Subcommittee on Administrative Practice and Procedures of the Committee on the Judiciary, United States Senate, 93rd Congress, 2nd session, "Freedom of Information Act Source Book: Legislative Materials, Cases, Articles," 1971, accessed March 24, 2021, https://www.justice.gov/sites/default/files/oip/legacy/2014/07/23/Sourcebk1974Final.pdf.

18. Daniel Patrick Moynihan, *Secrecy: The American Experience* (New Haven, CT: Yale University Press, 1998).

19. "Top Secret," "Secret," and "Confidential" are terms used to describe specific levels of classification and at the time of this writing defined in Presidential Executive Order 13526.

20. Paul E. Neff, "Letter to the Civil Agencies Concerning Automatic Downgrading and Declassifica-

tion of Cryptographic Information," October 17, 1961, NSA Archives, Accession 42663, Director's Correspondence 1961, Document Reference ID A110092.

21. Christopher Andrew, *For the President's Eyes Only: Secret Intelligence and the American Presidency from Washington to Bush* (New York: HarperCollins, 1995), 350-351.

22. Michael E. Unsworth, "Freedom of Information: Its Ebb and Flow," *American Libraries* 30, no. 6 (1999): 82-85, accessed March 9, 2021, http://www.jstor.org/stable/25637205.

23. President Richard Nixon, Executive Order 11652, "Classification and Declassification of National Security Information and Material," March 8, 1972, accessed March 10, 2021, https://fas.org/irp/offdocs/eo/eo-11652.htm.

24. President Richard Nixon, Executive Order 11652.

25. "Declassification, Records Management, and History Activity," April 11, 1972-June 18, 1992, NSA Archives, Accession 51066, Folder 3.

26. Roy R. Banner, "Impact of E.O. 11652 on NSA and Classified Cryptologic Information," March 21, 1972, NSA Archives, Accession 31973, Executive Order 10501—Safeguarding Classified Information 1955-1972, Document Reference ID A125460.

27. Harold C. Deutch, "The Historical Impact of Revealing the Ultra Secret," *Cryptologic Spectrum* 8, no. 1 (Winter 1978): 17-29, accessed March 10, 2021, https://www.nsa.gov/Portals/70/documents/news-features/declassified-documents/cryptologic-spectrum/ultra_secret.pdf.

28. William E. Colby, "Security in an Open Society," *Cryptologic Spectrum* 3, no. 4 (Fall 1973): 8-11, accessed March 10, 2021, https://www.nsa.gov/Portals/70/documents/news-features/declassified-documents/cryptologic-spectrum/Security_in_an_Open_Society.pdf.

29. Colby, "Security in an Open Society."

30. "The NSA Declassification Program: Doors Open Legally on Past U.S. Cryptologic Activities," *Cryptologic Spectrum* 10, no. 1 (Winter 1980): 5-9, accessed March 10, 2021, https://www.nsa.gov/Portals/70/documents/news-features/declassified-documents/cryptologic-spectrum/

nsa_declas_prog.pdf. See also Sarah Parsons, "Sources and Methods for Cryptologic History: NSA.gov—A Tour through its History and Resources."

31. Thomas R. Johnson, *American Cryptology During the Cold War, 1945-1989, Book III: Retrenchment and Reform, 1972-1980* (Fort Meade, MD: National Security Agency, 1998), 111.

32. "Index of NSA/CSS Cryptologic Documents offered to and accepted by the National Archives of the United States," September 1985, Center for Cryptologic History Reference Files, National Security Agency. MAGIC was the codeword given to intelligence derived from breaking Japanese diplomatic encryption systems in World War II.

33. Thomas R. Johnson, *American Cryptology During the Cold War, 1945-1989, Book III*, 111.

34. See also Sarah Parsons, "Sources and Methods for Cryptologic History: NSA.gov—A Tour through its History and Resources."

35. "Exhibit Opens at the Smithsonian Institution," *Cryptologic Spectrum* 11, no. 2 (Spring 1981): 22-23, accessed March 10, 2021, https://www.nsa.gov/Portals/70/documents/news-features/declassified-documents/cryptologic-spectrum/cryptologic_exhibit.pdf.

36. David Hatch, "*Cryptologic Almanac* 50th Anniversary Series: No Such Agency."

37. Sarah Parsons, "Sources and Methods for Cryptologic History: NSA.gov—A Tour through its History and Resources," 374; Daniel Patrick Moynihan, *Secrecy: Report of the Commission on Protecting and Reducing Government Secrecy* (Washington, DC: Government Printing Office, 1997), E-1; Michael Warner and Robert Louis Benson, *VENONA: Soviet Espionage and the American Response, 1939-1957* (Washington, DC: National Security Agency and Central Intelligence Agency, 1996), accessed March 24, 2021, https://permanent.access.gpo.

gov/websites/www.cia.gov/www.cia.gov/csi/books/venona/venona.htm.

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40. Steven Nelson, "NSA Wants Your Love: Agency 'has recognized that information sharing has to be a two-way street, and that it needs to bring something to the table'," *Washington Examiner* (January 22, 2019).

41. The Federation of American Scientists makes all EOs and directives relevant to the topic of classification and declassification accessible on their Project on Government Secrecy website, https://fas.org/issues/government-secrecy/. For an exceptionally helpful review of EOs relating to the topic of classification and declassification up through the Clinton EO 12958 see "Security Classification of Information: Volume 1. Introduction, History, and Adverse Impacts," by Arvin S. Quist, revised September 2002, accessed March 10, 2021, https://fas.org/sgp/library/quist/index.html.

On-the-Roof Gang: The Intercept Operators Who Made Naval Intelligence History

Matt Zullo
The US Navy's On-the-Roof Gang: Volume I—Prelude to War
Self-published, 2020, 442 pages

Review by Jessica Garrett-Harsch

In the world of intelligence, codebreaking is seen as glitzy, and intercept operations as mundane. It's hard to get people interested in the repetitive work of recording signals plucked out of the air to pass along to analysts to decipher. Clearly the work is essential, and has been since the beginning of the radio era, but it doesn't have the drama of an analyst breaking coded messages to thwart an enemy attack. In his new book, *The US Navy's On-the-Roof Gang: Volume 1—Prelude to War*, Matt Zullo shatters the notion that intercept is boring by telling the riveting story of the US Navy's program to exploit Japanese messages in the lead-up to World War II. This installment ends just after the attack on Pearl Harbor.

On-the-Roof Gang is a historical novel that is heavy on research and engaging in tone. At times it's hard to tell if you're reading engrossing nonfiction or incredibly well researched fiction. The author is clear that this is historical fiction (he has made up dialogue and filled in gaps from his own long naval history), but it's based on solid facts. For those not familiar with how the US Navy developed intercept operations against Japanese communications in the interwar period, this novel provides a thorough introduction. For those familiar with US intelligence during that period, it tells how navy capabilities developed from the work of a Morse operator with a dogged determination to identify unknown signals.

After the First World War, the US Navy was still a fairly small operation focused on defining its role on the world stage. The focus was primarily shipping and operations within the Pacific theater, including US bases in the Philippines, Hawaii, Guam, and even parts of China. The biggest threat in that region was the growing power of the Japanese Navy. However, the United States was not intercepting or decrypting the all-important Japanese naval messages that could give insight into Japanese leadership and military intentions. It was an intelligence gap that needed to be filled.

In 1921, a young radio electrician, Morse code expert, and ham radio enthusiast was stationed in Los Baños, Philippines, with the US Navy. Chief Radioman Harry "Pappy" Kidder, the hero of the story, spent his days working shifts as a US Navy Morse code operator and his nights intercepting unfamiliar Morse code at home. He quickly learned that the unfamiliar code was Japanese Morse code (katakana) and, with the help of a friend's Japanese wife, he learned Japanese. He

started copying the code every night and forwarding it to Navy Intelligence HQ in Washington, DC, known as OPS-20-G, where a team of talented experts took over.

The cast of characters at OPS-20-G is a who's who of early naval intelligence: Laurance Safford, Agnes Driscoll, Joseph Rochefort, and eventually Kidder. Historical evidence and fictional license weave together to draw the reader into how those mysterious messages arrived, how the team identified their importance, and how the team set out to crack them. The biggest challenge would be finding the funding to set up intercept sites throughout the Pacific to continue gathering these important messages.

Before it could set up intercept sites, the navy needed trained operators to make the sites operational. Kidder was chosen to set up a training course for navy Morse code operators at the navy building in downtown DC. Because of space limitations, the only location for a classroom was on the roof of the building, and hence the graduates became known as the On-the-Roof Gang (OTRG). The classroom was so small it accommodated only eight students per class, but Kidder, who was called "Pappy" by his students, took care of and was proud of each one. The graduates were then sent to intercept sites throughout the Pacific.

The book also delves into the personal side of the characters, which brings a heart to this novel that isn't common in books about intelligence history. The story focuses heavily on Kidder, who, while professionally successful, suffered multiple losses in his personal life. It also follows several of the OTRG graduates and instructors to show how their careers and personal lives progressed after training. The story deals adroitly with the characters' triumphs and disappointments.

The one part of the book that was a little tedious was the roster of each new OTRG class. Each class and its students were mentioned (there were approximately two classes a year throughout

the 1930s), and the names begin to run together. By the later chapters, very little is mentioned about the students who attended these classes other than a perfunctory description of the men, a detailed roster, and that they checked in to a boarding house. While this is important information, it could have been included at the end. What the repeated discussion of the new classes did allow for was the inclusion of the proprietor of the student boarding house, "Ma" Travers. She is a delightful character who plays an important supporting role to the students generally and Kidder specifically.

While the layperson, especially one interested in military history or World War II-related history, will enjoy this book, the target audience is those steeped in intelligence history. It will be like reading a book with a favorite cast of characters, but with new additions and a slightly new story line. This book is written from a different perspective than most books on intelligence history. Generally US military or intelligence history books focus on the efforts of those breaking codes; there has been very little in-depth information on the intercept operators who were copying down these coded messages. The book gives a voice, although a fictionalized voice, to the dozens of men (and yes, they were all men) who pioneered this type of intercept collection for the US Navy. Such collection would become a vital part of intelligence collection during the war and an essential part of naval operations. However, that's a story for the next volume, *The US Navy's On-the-Roof Gang: Volume 2—War in the Pacific*.

Jessica Garrett-Harsch came to the National Security Agency in 2006 as an Arabic language analyst. She joined the Center for Cryptologic History as the oral historian in January 2017. Her professional expertise is in Middle Eastern history, women's history, and counterterrorism.

Where Did They Come From? Why Classification Advisory Officers Are Unique to NSA

Patrick Bomgardner

Introduction

NSA employees with a classification question may reach out to one of the roughly 1,800 registered NSA classification advisory officers (CAOs), including me. I've been a CAO for over 20 years, and I retired as chief of the Information Security and Classification Division where I administered the CAO program. But a careful reading of Executive Order (EO) 13526, "Classified National Security Information," or its predecessors uncovers no mention of a CAO. So, how did NSA come to have the only formal CAO program in the Intelligence Community? [See glossary at end for specialized terms used throughout. —Ed.]

A Very Brief History of Classification

EO 13526 tells us that, "Throughout our history, the national defense has required that certain information be maintained in confidence in order to protect our citizens, our democratic institutions, our homeland security, and our interactions with foreign nations."[1] Indeed, as far back as November 29, 1775, the Second Continental Congress established the Committee of Secret Correspondence "to correspond with our friends in Great Britain, Ireland, and other parts of the world." While General George Washington saw a need

to protect military information during the Revolutionary War by marking his communications "Secret" or "Confidential," formal military secrecy regulations didn't appear until after the Civil War. The initial Army General Order of 1869 protected forts from unauthorized photographing or sketching. This order would evolve into a fully developed information security classification system by the time the United States entered World War I. US Army and Navy regulations also applied terms such as "secret," "confidential," and "restricted" to information related to other than armed forces installations and equipment, but without a stated reason or authority. It took a series of executive orders to formalize the classification levels, starting with President Franklin D. Roosevelt's EO 8381, "Defining Certain Vital Military and Naval Installations and Equipment," in 1940 and President Harry S. Truman's EO 10104, "Defining Certain Vital Military and Naval Installations and Equipment as Requiring Protection Against the General Dissemination of Information Relative Thereto," in 1950 and EO 10290, "Prescribing Regulations Establishing Minimum Standards for the Classification, Transmission, and Handling by Departments and Agencies of the Executive Branch, of Official Information Which Requires

Safeguarding in the Interests of the Security of the United States," in 1951.[2]

To make things even more complicated, during World War II, the Allies had to closely protect the fact that they were exploiting high-grade Japanese and German cipher systems. Dissemination of the information—codenamed MAGIC for that derived from the Japanese systems and ULTRA for that derived from the German systems—was restricted to only those recipients with a strict need to know.[3] After the war, the United States and Great Britain developed the formal compartment "Communication Intelligence" (COMINT) on top of the regular classification system with the signing of the 1946 British-US Communication Intelligence Agreement (a.k.a. BRUSA, later called UKUSA).[4]

Advising the NSA Adjutant General

When NSA was established in 1952, questions about classification were referred to the Agency's chief administrative officer, the adjutant general, Colonel George E. Campbell, USA. Of course, there were rules and precedents governing how original classifiers assigned correct classifications, but errors occurred, mostly involving overclassification and the occasional underclassification, thereby defeating the intended purpose of classification.[5]

So, NSA's vice director, Rear Admiral Joseph Wenger, USN, decided that Colonel Campbell needed some help. NSA Memorandum Number 10-61, dated April 17, 1953, established a Classification Advisory Panel "to assist the Adjutant General, particularly in the classification of technical material, in reviewing and passing on problems of correct security classification assignment." This panel was chaired by none other than special assistant to the director and cryptologic pioneer, William F. Friedman.[6] Other members included

- Technical director, Production
- Adjutant general
- Chief, Security Control Division
- Chief, Cryptologic Branch, Training Division
- Office of Communication Security representative (added later)[7]

Colonel Campbell called the panel's first meeting to order at 8:30 a.m. on September 2, 1953.[8] One of the first problems to be considered was the classification of COMINT, which the first director of NSA (DIRNSA), Lieutenant General Ralph Canine, USA, believed to be overclassified. Chief of Security S. Wesley Reynolds suggested that "the thinking in regard to classification ought to be liberalized to determine what must be protected under all circumstances and that a realistic approach should be taken toward other items." Friedman added, "The unrealism with which classification is regarded has weakened the security which is applied to items that really need to be protected."[9]

Dr. Lawrence Shinn, the Production organization's technical director, proposed the assignment of "an individual in NSA to devote full time to becoming an expert on classification problems" and that "he be attached to the Security Division." Reynolds, to the contrary, believed that the problem required collaboration of all individuals concerned.[10] At the suggestion of the Training Division representative, noted cryptologic linguist Dr. Sydney Jaffe, the panel agreed to establish committees throughout the main organizations to develop guidelines for classification, including the classification of branch, unit, and section titles. The panel further agreed that in connection with developing classification education, it could also assist the staff divisions and offices by providing guidelines on which to base some of their decisions. And so, the concept of the CAO was born.[11]

The Panel Tackles EO 10501, Then Disappears

President Dwight D. Eisenhower's 1953 EO 10501, "Safeguarding Official Information in

the Interests of the Defense of the United States," officially established TOP SECRET, SECRET, and CONFIDENTIAL as the three categories of classification. Additionally, Secretary of Defense Charles E. Wilson, who was also the former chief executive officer for General Motors, authorized the use of "FOR OFFICIAL USE ONLY" for information requiring protection outside the purview of EO 10501.[12]

In response to the new executive order, the Classification Advisory Panel, now including cryptologic luminaries Abraham Sinkov and Lambros Callimahos, would wrestle with creating "guide lines for use by originators in determining the classification of materials."[13] To see these men debate arcane issues of overclassification and underclassification and what should and shouldn't be compartmented should give comfort to everyone who has stressed over applying classification markings. The discussion at a January 29, 1954, meeting, for example, uncannily echoed conversations I've had with subject matter experts during prepublication reviews and more recently with my colleagues in the Center for Cryptologic History. Sinkov was of the opinion that it was too broad to say that all "cryptanalytic and other processes peculiar to the production of Special Intelligence" needed to be protected at the TOP SECRET Sensitive Compartmented Information (SCI) level. He argued that simply making a frequency count on a message was a cryptanalytic process peculiar to COMINT production and "we can read about that in the magazine section of the Sunday newspaper."[14] Colonel Campbell replied, "When you say cryptanalytic you might be talking about revealing the success or progress of the process." Sinkov agreed that, "if it indicates success, certainly it is Top Secret Codeword," but he noted that many processes in and of

themselves didn't justify classification, much less compartmentation.[15] They also discussed the problem of legacy markings, an issue CAOs run into regularly today, especially in the Center for Cryptologic History. In this case, EO 10501 had eliminated the "Restricted" handling caveat. Material formerly marked "Restricted" was automatically declassified on December 15, 1953, with exceptions including all material directly related to cryptographic systems which would be classified "CONFIDENTIAL."[16] (For more on the history of declassification, see Sarah Parsons's article in this issue "Pulling Back the Curtain: NSA's 50-Year Path to Transparency.") Friedman, in a foreshadowing of personal problems yet to come,[17] showed his dry wit:

> Who is the person setting up a division for giving relief, aid, and succor to NSA personnel who have to spend some time in a Government Penitentiary for violating the law? I learned yesterday that the Technical Manual 11-380 which deals with keying arrangements for converting the

M-209, which was published years ago, ten years ago, as a Restricted Manual is now Confidential. I was looking through my books at home and in my literary collection I found the 11-380. I don't have any three-tumbler safes at home to put that in. It is classified Confidential today. Here I am harboring a Confidential document in my home which if Mr. McCarthy finds out about, I am sure going to spend some time in jail. Will somebody bring me cookies?[18]

The panel's work would eventually be reflected in an update to NSA Regulation 121-7, "Storage of Classified Material," that effectively created NSA's first classification manual. Issued in April 1955, this new Regulation 121-7, now called "Security of Classified Information and Material," implemented EO 10501 and established policies and procedures for the safeguarding of classified information received by or originated within all elements of NSA (except those covered by Communications Security directives or regulations).[19] Additionally, it contained detailed examples of the kinds of information that fell into the three classification categories, as well as what was to be considered FOR OFFICIAL USE ONLY. Much to the chagrin of derivative classifiers and CAOs throughout NSA over the next six decades, this helpful level of detail would gradually be eliminated from subsequent classification manuals.[20]

Lieutenant General John Samford, USAF, replaced Canine as DIRNSA in November 1956, and new regulations were issued. NSA Regulation 11-1, dated February 28, 1957, established the Advisory Panel for Classification and Control of Information. In this iteration, not only did the panel assist the adjutant general with classification matters, it also helped the chief of staff in his duty of "evaluating the propriety and desirability of proposed releases of unclassified information to non-indoctrinated recipients."[21] The role of CAOs in providing guidance about the public release of NSA-related information would vary but endure into 2020. The panel, under the staff supervision of the adjutant general, consisted of the following:[22]

- Director of Operational Services
- Deputy Chief of Staff
- Director of the Research and Development Organization
- Director of the Communications Security Organization
- Director of Training
- Director of Security
- Director of Personnel

In August 1958, General Orders Number 60 abolished the Advisory Panel for Classification and Control of Information.[23] The General Orders provided no explanation for this action. The adjutant general was once again on his own when it came to questions about classification.

Two Important Studies

Vice Admiral Laurence Frost, USN, arrived as DIRNSA in November 1960 and soon approved a management study of document classification to determine the proper organizational responsibility for developing policies and guidelines for use in determining proper classification.[24] Based on the study's recommendations, Frost ordered in a March 20, 1962, memo that, "The Assistant Directors, NSA, shall designate classification advisory officers to resolve and/or provide guidance within their respective organizations on matters concerning security classification, and to coordinate security classification matters with the Office of Administrative Services and/or the Policy Staff, as appropriate."[25]

With the arrival of Lieutenant General Marshall Carter, USA, in June 1965, came yet another study "to determine if the present classification management system is able to meet the current

as well as future Agency needs."[26] The Report of Management Engineering Study on Classification Management noted that per VADM Frost's orders, "classification advice is provided by a loose association of 'Classification Advisory Officers,' all having additional duties."[27] While that may sound familiar to today's CAOs, they may be surprised to find that per the NSA Security Manual, assistant directors and chiefs of key components (KCs) and classification advisory officers had all been delegated authority to assign original TOP SECRET, SECRET, and CONFIDENTIAL classification.[28] So CAOs were also original classification authorities (OCAs), but there were only five of them, one designated for each of the major organizations: Assistant Director for the National Cryptologic Staff (ADN), Assistant Director for Production (ADP), Assistant Director for Communications Security (ADC), Assistant Director for Research and Development (ADRD), and Management Services Organization (L).

Deputy Director Louis Tordella concurred with the study's recommendations that the staff responsibility for classification management, including downgrading classifications and declassification, should be centralized in the Office of Administrative Services (L2), but the system of decentralized CAOs should remain unchanged.[29] This was because personnel performing classification advisory functions had to possess "technological specialization capacities which would be lost over an extended period of time if they were divorced from the technical and operational areas."[30] In other words, they recognized that, in most cases, CAOs were subject matter experts and then made the wise decision not to put all of the CAOs in one office. This remains true today. While administration of the CAO Program and oversight of NSA's Information Security Program is centralized in the Information Security and Classification Division (P131), CAOs are usually subject matter experts dispersed throughout the extended enterprise, providing specialized support to their assigned organizations.

The same study also recommended that since personnel in some areas weren't aware of their designated CAOs, the names and organizational locations of CAOs should be issued in general orders.[31] Today, P131 maintains a list of CAOs sorted by name or organization that can be easily accessed in a digital format by all employees.

According to the 1968 Office of Administrative Services Organization Manual, the chief of L2 was responsible for developing and implementing classification management policies and procedures; developing and issuing classification guidelines; serving as the NSA member on the Department of Defense (DoD) Classification Review and Advisory Board and contact to DoD on matters relating to classification and declassification of defense information; monitoring the NSA Classification Advisory Officer Program; coordinating the review of proposed NSA classified contracts and patent applications; and establishing and providing supervision of downgrading and declassification procedures.[32] Many of these responsibilities today are assigned to the Office of Information Management (P13), especially P131 and Declassification Services (P133).

The Information Security Program Evolves

NSA Regulation No. 120-3, dated April 14, 1969, formally established a "Classification Management Program" and implemented a DoD Directive 5120.33 requirement to "designate an Office within NSA as a point of contact for matters relating to classification and declassification of defense information."[33] The L2 classification management officer was officially designated and was responsible for, among a host of things, publishing a list of CAOs. The responsibilities of NSA CAOs were (and substantially still are):
• Providing guidance to personnel of their orga-

nizations, and other Classification Advisory Officers, on matters concerning security classification.

- Coordinating security classification matters with appropriate organizations outside of their own organizations and, as necessary and appropriate, requesting the advice and assistance of subject matter specialists within their organization.
- Reviewing and giving advice on the planning, development, and issuance of classification guides originated within their organizations and submitting these to the L2 Classification Management Officer for review and, if appropriate, for inclusion in the pertinent NSA Classification Manual, Guidelines, or Regulations.[34]

Under this regulation, ADN, ADP, ADC, and ADRD were responsible for designating CAOs for their organizations and keeping the L2 classification management officer apprised of any changes. The L2 classification management officer must have been very well versed in NSA operations and very busy, since he served as CAO for the Executive Office of the Director (D1), Inspector General (D2), Comptroller (D5), General Counsel (D6), Science and Technology Staff (N), National Cryptologic School (E), Personnel Management (M), Telecommunications (T1), and Operational Support Staff (L).[35]

An active "Information Security Program" replaced the "Classification Management Program" per an update to NSA Regulation 120-3, dated January 2, 1973.[36] Deputy Director Tordella designated Dayl D. Croskery, chief of the Policy Coordination Staff, to be NSA's information security program manager in accordance with DoD Directive 5200.1.[37] Interestingly, Croskery had been the Office of Communication Security representative to the very first Classification Advisory Panel in 1953.[38] This updated regulation also established an NSA Information Security Advisory Committee chaired by Croskery comprising the appointed CAOs.

Croskery convened the first NSA Information Security Advisory Committee meeting on October 16, 1973. The nine assembled CAOs discussed the new DoD requirement for paragraphs to be classified and marked individually, although the Office of the Assistant Secretary of Defense for Security Policy had informally advised that NSA information kept within its own channels could be "marked in accordance with our own instructions."[39]

Other topics included the publication of classification guidelines; a new DoD requirement for a system to index all classified documents; and an expected increase in declassification requests, especially for historical documents, as the public became more aware of the mandatory review provisions of DoD 5200.1-R (DoD Information Security Program Regulation). Finally, it was noted that "Classification Advisory Officers were responsible for assisting document preparers to be sure existing guidelines are implemented uniformly." Individual CAOs were charged with maintaining close coordination to assure uniformity of classification of similar documents.[40]

Executive Orders Balance Secrecy and Transparency

President Jimmy Carter's 1978 EO 12065, "National Security Information,"[41] created the Information Security Oversight Office (ISOO), which "provides for an informed American public by ensuring the minimum information necessary to the interest of national security is classified and that information is declassified as soon as it no longer requires protection."[42] NSA/CSS Regulation 120-3 was reissued on December 4, 1978, implementing the new executive order and making the designated "NSA/CSS Classification and Declassification Advisory Officers" responsible for providing guidance on any specific classification/declassification matters and giving advice on

classification/declassification guides originated within their organizations. This regulation also directed the chief of the Policy Staff, in his role as NSA/CSS information security program manager, to appoint the "Agency Senior Classification Advisory Officer." This resulted in a total of eight CAOs comprising the senior CAO and seven CAOs supporting the key components, that is, the Deputy Directors for Communication Security (C), Management Services (M), Operations (O), Research and Engineering (R), Telecommunications and Computer Services (T), and the Assistant Directors for Installations and Logistics (ADIL) and Plans and Resources (ADPR).[43] EO 12065 also reduced the number of agencies and officials with classification authorities. These eight CAOs served among the 50 designated OCAs[44] (down from an earlier 93).[45]

In the wake of several high-profile and damaging spy cases in the 1980s, President Reagan's Defense Department targeted reducing overclassification as a way of lessening vulnerability to espionage. In a 1986 memo, Deputy Secretary of Defense William H. Taft IV noted that "we all see a large number of documents classified TOP SECRET which, if disclosed to unauthorized persons, would not be expected to cause 'extremely grave damage' to the national security." He went on to explain that overclassification increases the volume of documents needing protection and degrades awareness of the criticality of information that is truly TOP SECRET, resulting in complacency in handling TOP SECRET data. He ordered that all OCAs be formally indoctrinated in the responsibilities of security classification as a prerequisite to the exercise of their authority. He also ordered that all those who deal with the substance of classified information "personally combat the tendency from gradual inflation of levels of classification."[46]

DIRSNA, Lieutenant General William Odom, USA, replied that "we have provided in-depth training to a cadre of full-time Classification Advisory Officers who not only provide final classification determinations, but also provide training and guidance to all Agency elements."[47] Additionally, "trained Classification Advisory Officers regularly visit our field elements throughout the world to ensure consistent classification compliance at all locations."[48] Today, since NSA field stations have their own on-site CAOs, some current travel-loving, headquarters-based CAOs may be surprised, and somewhat disappointed, to learn that is no longer necessary.

President Bill Clinton's EO 12958, "Classified National Security Information," issued on October 14, 1995, focused on the fact that America's democratic principles require that its people be informed of the activities of their government. The order had two major purposes: prevent the unauthorized disclosure of information and prevent the overclassification of information.[49] It also placed the responsibility for proper classification squarely on the shoulders of the derivative classifier.

An update to NSA/CSS Manual 123-2 issued in February 1998 explained that "Each Key Component has at least one Classification Advisory Officer (CAO), appointed by the KC Chief to serve as a CAO on a full-time basis or as their primary duty. CAOs are here to provide classification guidance to anyone who needs it. They can review resumes, help to develop classification guides, advise on information security matters, help with classification determinations, and much more. CAOs do their best to provide the most accurate, up to date information about classification issues using resources such as the NSA/CSS Classification Manual (NSA/CSS Manual 123-2) and the various classification/declassification guides."[50] By at least the beginning of the 1990s, CAOs were no longer acting at OCAs. However, the mission creep into areas like resumes and other prepublication reviews

may explain the proliferation of CAOs up to and during the 2000s.

Today's CAO Program

NSA/CSS Policy Manual 1-52 "Classified National Security Information," replaced NSA/CSS Manual 123-2 on November 23, 2004. A January 8, 2007, revision designated the associate director for Community Integration, Policy and Records—later the associate director for Policy and Records (DJ)—as the "classification and declassification authority for NSA/CSS classified information." In addition to their usual duties of providing classification advice and assisting with the development of classification guides, CAOs were now responsible for serving as a conduit for conveying classification-related information from and to the Office of Policy and Records (DJP); assessing the training needs of their organizations and assisting DJP in providing the necessary training; and assisting DJP with the Agency Self-Inspection Program.[51]

The official CAO Program, almost as it exists today, was first codified in a 2010 memorandum signed by the deputy associate director of Policy and Records. This is the first time a formal training requirement—successful completion of the course CLAS2200, "Principles of Classification and Information Security"—was levied on CAO aspirants.[52] A 2013 Inspector General audit of NSA's compliance with H.R.533-Reducing Over-Classification Act would result in the more stringent current training requirements.[53] The memo left it to the discretion of NSA/CSS managers and supervisors to determine and appoint the appropriate number of CAOs needed to support their organizations. For a while, Information Security Policy (DJ2) provided CAOs to the Signals Intelligence and Information Assurance Directorates, but those positions were eventually cut. In addition to the oft-stated duties, the program memo also lays out essential CAO attri-butes, including requisite knowledge, experience, and skills.

Today's program—established on September 2, 2020, by the chief of Policy, Information, Performance, and Exports (P1) and administered by P131 in accordance with NSA/CSS Policy 1-52[54]—emphasizes the CAO's advisory role, while putting the onus for proper marking and safeguarding squarely on every NSA affiliate who produces classified materials. It is not a CAO's job to approve or certify information as being properly classified, or to mark materials produced by others. The originator of the document is the derivative classifier and must be identified in the classification authority block.

Over the years, a number of administrative processes have been developed that require a CAO review, even though none of those processes were officially coordinated with the CAO Program Office. Today, the program office is trying to put that genie back in the bottle by prohibiting CAO reviews or checks from being mandated by policies, procedures, or other formal guidance without the written approval of the CAO program manager. The new program memo allows CAOs to provide ad hoc classification reviews to support education, training, and compliance objectives without formal CAO Program approval; however, CAOs' opinions do not absolve affiliates of their individual information security responsibilities.

Conclusion

So, now you know where CAOs came from. The CAO has been a unique NSA mainstay for nearly 70 years. It can be debated whether having specially trained CAOs has been an aid or a crutch for the rest of the workforce. On the one hand, CAOs take a special interest in this arcane field, enthusiastically going the extra mile to get the specialized training and provide classification and marking advice to their colleagues. On the other hand, some people may leave classifica-

tion to the CAOs rather than do the necessary research to do classification correctly. Regardless of how one feels about that debate, NSA CAOs will doubtless continue to be called upon to provide sound classification and marking advice. Ultimately, though, it's up to each individual producer of classified information to use that advice to mark it correctly.

Patrick Bomgardner is a Standby Active Reserve (SAR) employee in the Center for Cryptologic History. After a varied 41-year NSA career, he retired in September 2018 as chief of the Information Security and Classification Division.

Glossary

Classification - The act or process by which information is determined to be classified information.

Classification guide - A documentary form of classification guidance issued by an original classification authority that identifies the elements of information regarding a specific subject that must be classified and establishes the level and duration of classification for each such element.

Classified national security information - Information that has been determined to require protection against unauthorized disclosure and is marked to indicate its classified status when in documentary form.

Codeword - See Sensitive Compartmented Information (SCI).

Declassification - The authorized change in the status of information from classified information to unclassified information.

Declassification guide - Written instructions issued by a declassification authority that describe the elements of information regarding a specific subject that may be declassified and the elements that must remain classified.

Derivative classification - Incorporating, paraphrasing, restating, or generating in new form information that is already classified and marking the newly developed material consistent with the classification markings that apply to the source information. Derivative classification includes the classification of information based on classification guidance. The duplication or reproduction of existing classified information is not derivative classification.

Indoctrination - The initial briefing and instructions given before a person is granted access to classified national security information.

Legacy marking - An obsolete classification marking.

Mandatory declassification review - A process for reviewing information for possible declassification upon request. Any individual or organization may request a declassification review of information classified pursuant to EO 13526 or previous classified national security information orders.

Need to know - A determination within the Executive Branch in accordance with directives issued pursuant to EO 13526 that a prospective recipient requires access to specific classified information in order to perform or assist in a lawful or authorized governmental function.

Original classification - An initial determination that information requires, in the interest of national security, protection against unauthorized disclosure.

Original classification authority (OCA) - An individual authorized in writing, either by the President, the Vice President, or by agency heads or other officials designated by the President, to classify information in the first instance.

Sensitive Compartmented Information (SCI) - Classified national intelligence information concerning or derived from intelligence sources, methods, or analytic processes that is required to be handled within formal access

control systems established by the Director of National Intelligence.

Special Intelligence (SI) - An SCI control system designed to protect technical and intelligence information derived from monitoring foreign communications signals by other than the intended recipients. SI is also referred to as COMINT.

Notes

1. "Executive Order 13526 of December 29, 2009, Classified National Security Information," *Federal Register* 75, no. 2 (January 5, 2010), 707-731, accessed September 18, 2019, https://www.hsdl.org/?abstract&did=30722.

2. US Congress, Twenty-ninth Report by the Committee on Government Operations, *Security Classification Policy and Executive Order 12356* (Washington, DC: US Government Printing Office, 1982), 4-8, accessed September 18, 2019, https://www.cia.gov/readingroom/document/cia-rdp-93m00914r001800100054-7.

3. Center for the Study of Intelligence, *Critique of the Codeword Compartment in the CIA* (Washington, DC: Central Intelligence Agency, 1977), 4-5, accessed September 18, 2019, https://www.cia.gov/readingroom/document/cia-rdp-83b00823r000900180001-6.

4. Appendix A to the British-U.S. C.I. Agreement, British-U.S. Communication Intelligence Security and Dissemination Regulations, February 26, 1946, accessed March 1, 2022, https://media.defense.gov/2021/Jul/15/2002763704/-1/-1/0/APPENDICES_A-G_26FEB46.PDF.

5. Captain P. P. Leigh, USN, Acting Chief of Staff, to Colonel George E. Campbell, Adjutant General, NSA Memorandum Number 10-61, April 17, 1953, Establishment of Classification Advisory Panel, NSA Archives, Accession 47271, Document Reference ID A329145.

6. Leigh, Memorandum Number 10-61.

7. Colonel Alfred R. Marcy, Chief of Staff, General Orders Number 40, Appointment [of Dayl Croskery to the NSA Classification Advisory Panel], May 14, 1953, NSA Archives, Accession 47271, Document Reference ID A329142.

8. Minutes of the NSA Classification Advisory Panel (CAP) Meeting, September 2, 1953, and September 18, 1953, accessed March 2, 2022, https://www.nsa.gov/portals/75/documents/news-features/declassified-documents/friedman-documents/panel-committee-board/FOLDER_380/41764499080362.pdf.

9. Minutes, September 2, 1953.

10. Minutes, September 2, 1953.

11. Minutes, September 2, 1953.

12. Colonel George Campbell, Adjutant General, Disposition Form, Subject: Security Handling, July 29, 1954, accessed March 2, 2022, https://www.nsa.gov/Portals/75/documents/news-features/declassified-documents/friedman-documents/reports-research/FOLDER_376/41754439079358.pdf.

13. Colonel George E. Campbell, Adjutant General, Minutes of the NSA Classification Advisory Panel Meeting, January 29, 1954, and February 3, 1954, accessed December 15, 2020, https://www.nsa.gov/Portals/75/documents/news-features/declassified-documents/friedman-documents/panel-committee-board/FOLDER_380/42029919106873.pdf

14. Transcript of NSA Classification Advisory Panel Meeting, January 29, 1954, 6, accessed March 2, 2022, https://www.nsa.gov/portals/75/documents/news-features/declassified-documents/friedman-documents/panel-committee-board/FOLDER_380/41764479080360.pdf.

15. Transcript, January 29, 1954, 6.

16. Colonel George E. Campbell, Adjutant General, Disposition Form, Subject: Presidential Order Affecting Security Classification, November 20, 1953, accessed March 2, 2022, https://www.nsa.gov/portals/75/documents/news-features/declassified-documents/friedman-documents/panel-committee-board/FOLDER_380/41764429080355.pdf.

17. In his retirement, Friedman would run afoul of NSA security under very similar circumstances. For further reading, see Rose Mary M. Sheldon, "William Friedman: A Very Private Cryptographer and His Collection," *Cryptologic Quarterly* 2015-01, vol. 34 (2015): 19-21, accessed March 2, 2022, https://media.defense.gov/2021/Jul/13/2002762051/-1/-1/0/CRYPTOLOGIC-QUARTERLY-2015-01.PDF.

18. The "Mr. McCarthy" referred to here is Wisconsin Senator Joseph McCarthy, famous for his investigation of communist infiltration of the United States government in the 1950s. Transcript, January 29, 1954, 28.

19. NSA Regulation Number 121-7, Security of Classified Information and Material, April 8, 1955, accessed March 2, 2022, https://www.nsa.gov/Portals/75/documents/news-features/declassified-documents/friedman-documents/reports-research/FOLDER_059/41711419075073.pdf.

20. Good classification guidance is a necessity for CAOs, but if you're trying to keep score, the history of NSA classification guidance can be hard to follow. On September 23, 1960, all of the "Security of Classified Information and Material" information found in Regulation 121-7 was reincorporated into the NSA Security Manual 120-1, where it would remain until January 8, 1971, when it was placed in NSA/CSS Manual 123-2, the "NSA Classification Manual." Manual 123-2 was superseded by NSA/CSS Policy Manual 1-52, "NSA/CSS Classification Manual," on November 23, 2008. The current version of Policy Manual 1-52 was issued on January 10, 2019, and last updated on September 13, 2019.

21. NSA Regulation Number 11-1, Advisory Panel for Classification and Control of Information, February 28, 1957, NSA Archives, Accession 48163, Document Reference ID 307932.

22. NSA Regulation Number 11-1.

23. General Orders Number 60, Abolishment of Committee, August 27, 1958, NSA Archives, Accession 16610, Document Reference ID A172991.

24. Report of Management Study on Document Classification, August 29, 1961, NSA Archives, Accession 32646, Document Reference ID A115015.

25. Vice Admiral L. H. Frost, Director, Disposition Form, Subject: Management Study—Document Classification, March 20, 1962, NSA Archives, Accession 47271, Document Reference ID A112891.

26. Report of Management Engineering Study on Classification Management, December 30, 1965, NSA Archives, Accession 44500, Document Reference ID A260907.

27. Report on Classification Management, December 30, 1965, 1.

28. Report on Classification Management, December 30, 1965, Tab B, 2.

29. Louis W. Tordella, Deputy Director, Memorandum, Subject: Classification Management, July 19, 1966, NSA Archives, Accession 23469, Document Reference ID A298142.

30. Report on Classification Management, December 30, 1965, 2.

31. Report on Classification Management, December 30, 1965, 3.

32. Office of Administrative Services Organization Manual, October 10, 1968, 2, NSA Archives, Accession 46450, Document Reference ID A2358234.

33. NSA Regulation Number 120-3, NSA Classification Management Program, April 14, 1969, 5, NSA Archives, Accession 47271, Document Reference ID A298548.

34. NSA Regulation Number 120-3, April 14, 1969, 5.

35. NSA Regulation Number 120-3, April 14, 1969, 5.

36. NSA Regulation Number 120-3, NSA/CSS Information Security Program, January 2, 1973, NSA Archives, Accession H09-0204-7, Document Reference ID A298552.

37. Louis W. Tordella, Deputy Director, Memorandum (Serial: N0698) for the Assistant Secretary of Defense, Comptroller, Subject: DoD Information Security Program, June 27, 1972, NSA Archives, Accession 25854, Document Reference ID A298217.

38. Marcy, General Orders Number 40, May 14, 1953.

39. G. P. Morgan, D41, Memorandum for the Record, Subject: Meeting of Classification Advisory Officers, October 30, 1973, NSA Archives, Accession 39287, Document Reference ID A454461.

40. Morgan, Meeting of Classification Advisory Officers, October 30, 1973.

41. "Executive Order 12065 of June 29, 1978, National Security Information," accessed February 24, 2021, https://www.hsdl.org/?abstract&did=457386.

42. National Archives Web Site, ISOO for the Public, accessed February 24, 2021, https://www.archives_prior_to_20160729.gov/isoo/public/index.html.

43. NSA/CSS Regulation 120-3, NSA/CSS Information Security Program, December 4, 1978. NSA Archives, Document Reference ID A309227.

44. M. J. Levin, Chief Policy Staff, Memorandum to DIRNSA, Subject: Designation of Officials to Exercise Original Classification Authority Under E.O. 12065, December 12, 1978, NSA Archives, Accession 20879, Document Reference ID A2277097.

45. It's interesting to note that in a Memorandum (Serial: N0839) for the Assistant Secretary of Defense (Comptroller) dated August 9, 1974, Dayl Croskery, Chief of Policy Coordination, requested that NSA's total number of positions authorized to make TOP SECRET original classification decisions be reduced from 93 to 2, the two being the Director and Deputy Director. This was because the list of Original Classification Authorities was publicly available in the UNCLASSIFIED DoD 5200.1-R, "Information Security Program Regulation." NSA contended that publicly releasing NSA organizational designators violated public law 86-36. NSA Archives, Accession 27753, Document Reference ID A248408. Today there are 18 NSA OCAs.

46. William H. Taft IV, Memorandum, Subject: Initial Classification of Information, May 22, 1986, NSA Archives, Accession 47271, Document Reference ID A3921664.

47. Lieutenant General William E. Odom, Director NSA/Chief CSS, Memorandum (Serial: J-375-86) for the Under Secretary of Defense (Policy), August 1, 1986, NSA Archives, Accession 50076, Document Reference ID A3921664.

48. Odom, Memorandum, August 1, 1986.

49. "Executive Order 12958 of April 17, 1995, Classified National Security Information," *Federal Register* 60, no. 76 (April 20, 1995), accessed February 24, 2021, https://www.hsdl.org/?abstract&did=3682.

50. NSA/CSS Manual 123-2, NSA/CSS Classification Manual, February 24, 1998, NSA Archives, Accession 34465, Document Reference ID A3280612.

51. NSA/CSS Policy Manual 1-52, NSA/CSS Classification Manual, November 23, 2004 (Revised January 8, 2007), NSA Archives, Document Reference ID A3680119.

52. Deputy Associate Director, Policy and Records, NSA/CSS Memorandum, Subject: NSA/CSS Classification Advisory Officer Program, June 21,

2010, NSA Archives, Document Reference ID A4078810.

53. Inspector General Report, Report on the Audit of NSA's Compliance with Public Law 111-258, the "Reducing Over-Classification Act," AU-13-0005, August 7, 2013, 32, NSA Archives, Document Reference ID A4086663.

54. Chief of Policy, Information, Performance, and Exports, NSA/CSS Memorandum; Subject: NSA/CSS Classification Advisory Program, September 2, 2020, accessed internally October 19, 2021.

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