MILITARY INTELLIGENCE

Map labels and locations:

- **1** Herbert Yardley
- Welcome Center
- **2** William J. Donovan
- **3** Joseph E. Maxfield
- **9** James W. Pryde
- **7** Forrest R. Biard
- **4** Francis G. Powers
- **8** Elizabeth Hanson & Jennifer Matthews
- **5** Stephanie Rader
- **6** Elizebeth & William Friedman

We love hearing about your visit! Share your pictures, questions, and favorite parts of the tour on Facebook, Twitter, and Instagram.

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#ANCEducation #MilIntelANC

ENGAGE

MILITARY INTELLIGENCE

Length: ~3.5 miles   **Starting Point: Section 30 (0.2 miles from Welcome Center)**   **Exertion Level: High**

There are three types of stops on this walking tour:

HONOR stops mark the gravesites of specific individuals.

REMEMBER stops commemorate events, ideas or groups of people.

EXPLORE stops invite you to discover what this history means to you.

#	Name	Location	Type
1	Herbert Yardley	Section 30, Grave 429-1-2	HONOR
2	William J. Donovan	Section 2, Grave 4874-RH	HONOR, EXPLORE
3	Joseph E. Maxfield	Section 2, Grave 3836-NS	HONOR
4	Francis G. Powers	Section 11, Grave 685-2	HONOR
5	Stephanie Rader	Section 11, Grave 614-B	HONOR
6	Elizebeth & William Friedman	Section 8, Grave 6374-A	HONOR, EXPLORE
7	Forrest R. Biard	Section 60, Grave 6838	HONOR
8	Elizabeth Hanson & Jennifer Matthews	Section 60, Grave 8978	HONOR
9	James W. Pryde	Columbarium 9/N43/18/1	HONOR

MILITARY INTELLIGENCE HISTORY

Arlington National Cemetery is the final resting place of many individuals who shaped the United States' modern intelligence programs — both military and civilian. For most of U.S. history, intelligence operations existed only during wartime. During the American Revolution, General George Washington directed a network of secret agents and reconnaissance scouts whose intelligence he used to plan and conduct military operations. During the Civil War, the U.S. Army created the Bureau of Military Information (BMI), which collected and analyzed data from an array of sources — cavalry reconnaissance, Signal Corps observation posts, newspapers, and intercepted communications — to inform the U.S. Army's strategy. In the 1880s, both the Army and the Navy created separate peacetime intelligence operations to scout and collect intelligence on foreign militaries. However, these organizations were small, and their reach was limited.

World War I marked the start of more modern intelligence operations. Many of the organizations created at this time established the precedent for today's military and national intelligence agencies. Although military intelligence was still viewed as primarily a wartime activity, some individuals began arguing for more permanent, large-scale intelligence organizations, and the military began improving and expanding its intelligence capabilities — especially its signal intelligence and cryptanalysis capabilities.

World War II was a watershed moment for United States' intelligence efforts, and the first time that American intelligence activities were coordinated across military and civilian agencies. Before World War II, every military branch and civilian federal agencies ran separate, and sometimes competing, intelligence offices. World War II forced intelligence services to work together and to increase their knowledge and capabilities to defeat the Axis powers. Following World War II, Congress passed the National Security Act of 1947, which streamlined American intelligence agencies under civilian control and ensured the existence of intelligence operations in peacetime. The act merged the military service branches under the Department of Defense, and it established the Central Intelligence Agency and the National Security Council.

Military intelligence vs. National intelligence

Military and national intelligence are closely aligned and often overlap, but they are not the same. Military intelligence is tactical and short-term; it aims to understand enemy troop movements, weapons systems capabilities, and even the weather. On the other hand, national intelligence is strategic and aims to understand what may occur in the next 20-50 years. It asks questions such as: How is a nation's economy doing? Will the current education system produce good scientists in 20 years? Who are the nation's allies?

Tuskegee Airman cadets learn morse code, January 1942. (LOC)

There are five main types of intelligence operations:

- Human intelligence (HUMINT): On-the-ground intelligence gathered by individuals.

- Counterintelligence (CI): Intelligence gathered to protect against espionage, sabotage, and activities conducted by or for foreign powers.

- Imagery Intelligence (IMINT): Intelligence gathered from analyzing satellite imagery or aerial photography.

- Measurement and Signature Intelligence (MASINT): Intelligence gathered from tracking, identifying, and analyzing distinct characteristics (signatures) of fixed or dynamic sources. Sources include radar, nuclear energy, chemical materials, and magnetic fields.

- Signals intelligence (SIGINT): Intelligence gathered via intercepting signals from communications systems, radar, and weapons systems. Communication signals are often encrypted and require cryptanalysis.

MAJOR HERBERT YARDLEY

HONOR

WALKING TOUR STOP 1
Section 30, Grave 429-1-2

BIRTH: April 13, 1889, Worthington, IN

DEATH: August 7, 1958, Washington, D.C.

EARLY & PERSONAL LIFE: Yardley is one of the most revered and despised figures in intelligence history. He grew up in a small town in Indiana, where he played quarterback on his high school's football team and learned poker in the local saloons. After graduating from high school in 1907, Yardley followed in his father's footsteps to work as a railroad telegrapher. In 1912, he took the civil service examination. His score earned him a job as a Department of State code clerk, and he moved to Washington, D.C. Two years later, Yardley married Hazel Milam, who had grown up across the street from him in Worthington. They had one son.

CAREER: While working as a code clerk in the State Department and reading encrypted telegrams from diplomatic offices around the world, Yardley became interested in cryptology. He wondered whether the United States' messages were truly safe from foreign interests, and he began studying cryptology in his free time. One night, while working late, Yardley intercepted an encrypted telegraph to President Woodrow Wilson from one of the president's advisors. To Yardley's surprise and horror, he easily solved the message. Yardley was now even more determined to pursue a career in cryptology.

Herbert Yardley, undated. (NSA)
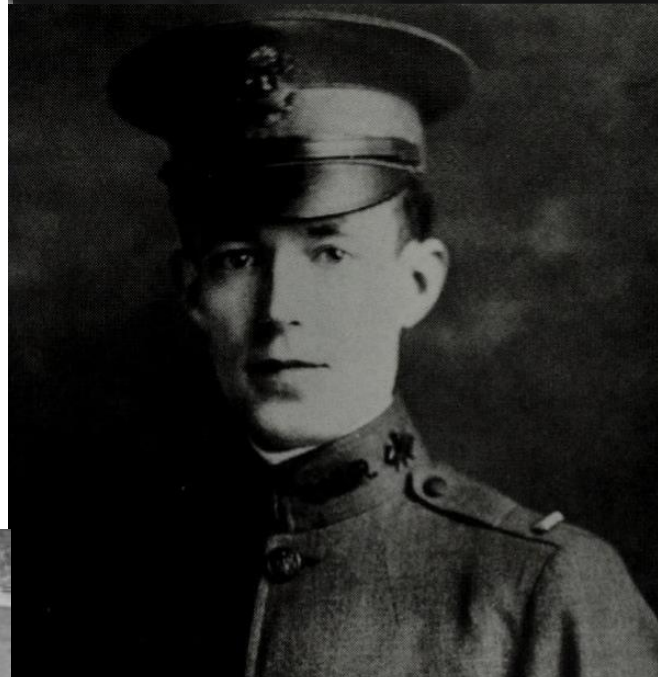
Second Lieutenant Yardley around the time he founded MI-8 in 1917. (National Archives)

Army cryptologists Lieutenant J. Rives Childs and Capt. Yardley during the Paris Peace Conference, 1919. (National Archives)

INTELLIGENCE WALKING TOUR

From the Welcome Center, turn right on Eisenhower Dr and go through both sets of gates. Turn left onto the Custis Walk. On the right, Yardley's grave is the last plot in the fifth row from the road.

When the United States entered World War I in 1917, Yardley convinced the head of the Army's intelligence section that the Army needed a codebreaking agency dedicated to analyzing enemy codes and ciphers. In July 1917, Yardley took charge of the newly-created MI-8, or Military Intelligence, Section 8 — America's first cryptology agency. Throughout the war, MI-8 examined messages for the War, Navy, State, and Justice Departments. The messages came from commercial telegraph and cable companies as well as intercepted radio messages and foreign and domestic mail. As the agency grew, it separated into five subsections: Code and Cipher Compilation, Code and Cipher Solution, Communications, Shorthand, and Secret Ink. Toward the end of the war, Yardley traveled to Europe to study how French and British intelligence bureaus solved enemy codes and ciphers.

When Yardley returned from Europe, he found, much to his dismay, the Army in the midst of dismantling MI-8. He believed the United States needed a permanent code and cipher organization. In May 1919, the acting secretary of state and the Army chief of staff approved Yardley's plan for a joint State and War Department organization and formed the American Black Chamber — a permanent, peacetime Cipher Bureau.

The Black Chamber was both incredibly small and incredibly secret. Headquartered in New York City, it was charged with decrypting foreign diplomatic communications — primarily those from Latin American countries, Germany, Spain, and Japan.

The Black Chamber decoded its most important message during the 1921 Washington Naval Conference. A decoded telegram revealed that Japan was willing to accept a 5-5-3 battleship ratio for the United States, Great Britain, and itself, respectively, despite publicly insisting on a 10-10-7 ratio. This revelation allowed the U.S. secretary of state to push harder during the conference, knowing that Japan would eventually agree to the United States' terms.

In 1929, President Herbert Hoover appointed Henry L. Stimson as his new secretary of state. When Stimson learned of Yardley's Cipher Bureau, he immediately opposed its existence and withdrew the State Department's funding, effectively closing the Bureau. Stimson believed it was immoral for State Department employees to spy on foreign powers, famously stating, "Gentlemen do not read each other's mail." At the same time the Black Chamber was falling, William Friedman's (Stop 6) Signal Corps Code and Cipher Section was rising. (This organization evolved into the Signal Intelligence Service — the predecessor to today's National Security Agency). It is still unclear whether these events were related.

With the Cipher Bureau closed, Yardley faced unemployment at the start of the Great Depression. Finding no alternatives for income, Yardley decided to write a book exposing the United States' cryptology secrets. Published in 1931, *The American Black Chamber* revealed everything about the Cipher Bureau from the last 12 years — its techniques, successes, organizational structure, and more. It even included actual communication intercepts and their decryptions. The book was a bombshell and immediately made Yardley a pariah in the intelligence field. He never again worked in intelligence for the United States.

LEGACY: In 1999, the National Security Agency added Yardley to its Hall of Honor. Although Yardley's career ended in controversy, he was undoubtedly integral to the rise of cryptology in American intelligence work. He proved that codebreaking was an important pillar of intelligence work, a fact that remains true today.

YARDLEYGRAM
By Herbert O. Yardley

●	E	N	R	E	A	T	S	S	I
D	E	I	T	R	N	C	E	E	P
T	I	E	K	R	I	N	L	I	I
M	H	S	I	N	I	E	V	B	S
P	S	E	N	N	M	T	A	D	N
S	R	T	G	E	A	R	E	G	I
U	N	H	H	S	E	I	R	S	C
D	C	A	A	S	T	V	E	A	S
K	E	R	I	H	E	E	T	S	N
★	E	K	C	L	I	H	F	D	A

There is a complete message hidden in the square above. It can be found by drawing a continuous pencil line through the correct letters, vertically, horizontally, or diagonally. The pencil lines, when done correctly, will give a symmetrical design. No letter may be used more than once. Start at the ● Finish at the ★
The solution will appear next week.

Left: Yardley with Georges Jean Painvin, a famous WWI-era French cryptologist who taught Yardley about codebreaking, undated. (The Reader of Gentlemen's Mail)
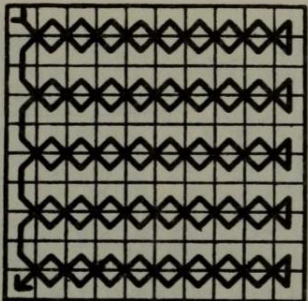
Right and below: Yardleygram and answer, circa 1931-1932. (Liberty magazine)

YARDLEYGRAM ANSWER
LAST WEEK'S PROBLEM

Drawing your pencil line as indicated at the left will give you this message:
Entente spies carried their invisible inks impregnated in garments, such as ties, scarfs, handkerchiefs, and the like.

MAJOR GENERAL WILLIAM J. DONOVAN

BIRTH: January 1, 1883, Buffalo, NY

DEATH: February 8, 1959, Washington, D.C.

EARLY & PERSONAL LIFE: Donovan is widely considered as the father of America's centralized intelligence. He grew up in a working-class, Irish-Catholic household in Buffalo, New York. After attending Columbia College on a scholarship, Donovan earned a law degree from Columbia Law School. He returned to upstate New York in 1908 to practice law. In 1914, he married Ruth Rumsey. They had two children.

CAREER: Donovan received the Medal of Honor for extraordinary heroism in action at Landres-et-St. Georges, France during World War I. He also earned the Distinguished Service Medal and his nickname, "Wild Bill," during the war.

When Donovan returned to the U.S. in 1919, he resumed his law practice and sought political office. He served as assistant U.S. attorney general under President Calvin Coolidge, and in 1932, he unsuccessfully ran for New York governor. Over the next eight years, Donovan expanded his law practice internationally and advocated for interventionist foreign policies.

In 1940, World War II was raging in Europe. France had fallen to Germany, but Great Britain was still standing. In July 1940, President Franklin D. Roosevelt sent Donovan to Britain to evaluate its military and intelligence capabilities and the likelihood that it could survive a German attack. Roosevelt intended to use Donovan's findings to convince American leaders to increase aid to Great Britain. During this visit, Donovan met the leading figures in the British Secret Intelligence Service (MI6) and learned cutting-edge intelligence techniques — both signals intelligence and on-the-ground human intelligence.

Upon his return, Donovan advocated for a centralized American strategic intelligence agency. At the time, the U.S. military had a few agencies dedicated to signals intelligence, but those units primarily focused on tactical rather than strategic intelligence. The military was also hesitant to conduct human, social, or economic intelligence, which Donovan believed the U.S. needed. Finally, in June 1941, Donovan convinced President Roosevelt to create a centralized strategic intelligence agency.

Donovan returning from World War I, April 21, 1919. (National Archives)

Donovan as head of the OSS, 1942-1945. (CIA)

INTELLIGENCE WALKING TOUR

Return to the Custis Walk and turn right. Turn left on Sheridan Dr and again on Grant Drive. Immediately after the sidewalk with benches end, turn right into Section 2. Donovan's gravesite is 5 plots in from Grant Dr.

MAJOR GENERAL WILLIAM J. DONOVAN

On July 11, 1941, Roosevelt created the Office of Coordinator of Information (COI) and tapped Donovan to lead the agency. Donovan's first priorities were to establish research and analysis capabilities, a propaganda section devoted to undermining enemy governments' credibility, and a secret espionage and counter-espionage division. The organization was originally entirely civilian. However, in June 1942, after the United States had officially entered World War II, Roosevelt expanded the organization's power, renamed it the Office of Strategic Services (OSS), and placed it under the Joint Chiefs of Staff.

Throughout the war, the OSS, and Donovan himself, tried intelligence campaigns of all sorts. These campaigns ranged from counterfeiting enemy currency to analyzing the psyches of German leaders to helping organize assignation attempts on Hitler to planting agents inside Germany in the last months of the war.

Donovan advocated retaining a centralized intelligence organization after the war. He stated, "The national policy of the United States in the postwar world will be shaped by our knowledge or ignorance of our fellow nations. America cannot afford to resume its prewar indifference."[1] Despite Donovan's recommendation, President Harry Truman disbanded the OSS in 1945. However, two years later, Congress created the Central Intelligence Agency, effectively reinstating the organization. Truman passed over Donovan as director and instead chose Allen Dulles.

LEGACY: Former OSS officer Walter Lord once described Donovan as "[b]rilliant, energetic, imaginative, and resourceful, [but] unfortunately also selfish, petty, extravagant, and something of a racketeer."[2] Despite making his fair share of political enemies along the way, Donovan succeeding at building a centralized American strategic intelligence agency, something that required every ounce of his charisma, imagination, and determination.

Former OSS officer and CIA director Richard Helms (Section 7, Grave 8142-1) reflected on the wartime organization, "I don't think it made any difference, or much difference. ... There were some successes, but it was not a howling success."[3] Regardless of the OSS's success in affecting the outcome of World War II, it undoubtedly forged the path for the CIA. Donovan's vision of a worldwide strategic intelligence service lives on in the CIA.

The OSS Memorial

In October 2022, Arlington National Cemetery dedicated the Office of Strategic Services (OSS) Memorial, which honors more than 125 military service members killed in action while serving in the OSS during World War II. Established on June 13, 1942, the OSS preceded the CIA. Its personnel included members from every branch of the U.S. military.

OSS personnel (totaling approximately 13,000 by late 1944) served in every theater of the war, as well as in Washington, D.C. The intelligence that they gathered and analyzed played a key role in Allied military victories during the war, as well as in shaping U.S. foreign policy objectives overall. The success of the OSS in World War II also laid groundwork for a permanent intelligence infrastructure, culminating in the creation of the CIA in 1947 (as part of that year's landmark National Security Act).

The Office of Strategic Services Memorial specifically honors those members who were in the military at the time of their deaths. The carving on its front side bears the OSS symbol, a spearhead.

Donovan (center, back row) with members of the OSS Operational Groups at the Congressional Country Club in Bethesda, MD, a WWII OSS training facility, circa 1942-1945. (OSS Society)

INTELLIGENCE WALKING TOUR

The OSS Memorial is located steps away from Donovan's gravesite in Section 2, at the intersection of Roosevelt and Grant Drives.

THE U.S. INTELLIGENCE COMMUNITY

EXPLORE

The U.S. Intelligence Community has grown significantly since World War II. Today, it includes 18 organizations — two independent national agencies, ten military organizations, and six offices within other federal departments and agencies. These are permanent, peacetime operations that work both separately and together to collect and analyze intelligence to support U.S. foreign policy and national security.

President Ronald Reagan established the U.S. Intelligence Community (IC) by executive order in 1981. The order outlined the goals and priorities for each intelligence organization and stated that "[t]imely and accurate information about the activities, capabilities, plans, and intentions of foreign powers, organizations, and persons and their agents, is essential to the national security of the United States."[4]

WITHIN THE DEPARTMENT OF DEFENSE

Air Force Intelligence	Army Intelligence	Coast Guard Intelligence	Marine Corps Intelligence	Navy Intelligence	Space Force Intelligence

Defense Intelligence Agency	National Geospatial-Intelligence Agency	National Reconnaissance Office	National Security Agency

WITHIN OTHER FEDERAL DEPARTMENTS & AGENCIES

Department of Energy	Department of Homeland Security	Department of State	Department of the Treasury	Drug Enforcement Administration	Federal Bureau of Investigation

INDEPENDENT NATIONAL AGENCIES

Office of the Director of National Intelligence   Central Intelligence Agency

REFLECTION

- What is the benefit of using multiple methods to conduct intelligence work? For example: What can you learn from satellite imagery that you could not learn from talking to an inside source, and vice versa?

- It is sometimes hard to distinguish between military and civilian personnel in intelligence work, since the different sections of the IC often work closely together. This means that many people who serve in the line of duty for intelligence are not considered veterans. How do you understand their service? How do you think the United States should recognize their service?

MAJOR
JOSEPH E. MAXFIELD

HONOR

WALKING TOUR STOP 3
Section 2, Grave 3836-NS

BIRTH: April 3, 1860, Salem, MA

DEATH: April 14, 1926, Washington, D.C.

EARLY & PERSONAL LIFE: Maxfield graduated from Harvard College in 1881 and joined the Army Signal Corps shortly thereafter. He married Harriet W. Manfield on July 30, 1884, and together they had two children.

CAREER: The U.S. Army established the Signal Corps during the Civil War to manage communications, especially over long distances, and to collect weather data. In February 1895, Maxfield was named chief signal officer for the Army's Department of the Missouri, managing military communications across much of the midwestern United States.
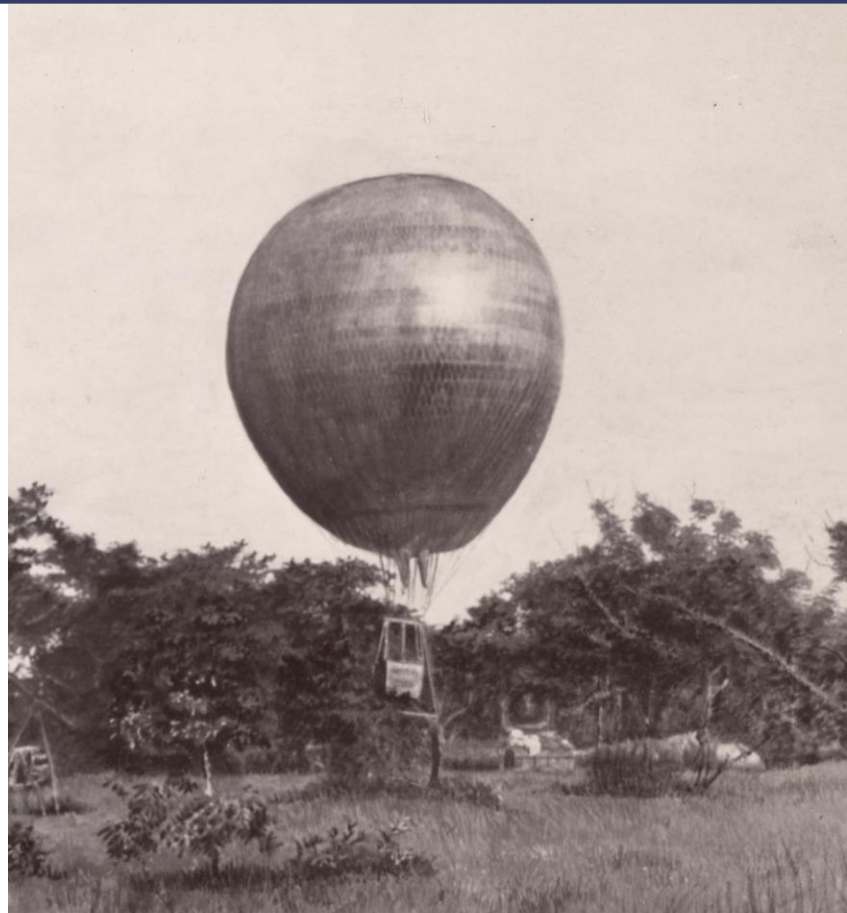
During the Spanish-American War in 1898, Maxfield took on a unique role as head of a 23-man balloon detachment deployed to Cuba. A balloon could rise above the dense jungle, allowing for aerial mapping and reconnaissance of Spanish positions. However, the Army command in Cuba did not fully appreciate the advantages of using balloons, and Maxfield and his detachment faced many difficulties. First, they were provided only a single silk balloon, handsewn by Signal Corps

Drawing of the balloon at San Juan Ford during the Battle of San Juan Hill on July 1, 1898. (National Archives)

INTELLIGENCE
WALKING TOUR

Return to Grant Dr and turn left. Turn left onto Sheridan Dr. Passing the stairs, the road will begin to curve to the left. After the first row ends, Maxfield's grave is three plots to the right and directly next to several large headstones.

members and at least one of their wives. During transport to Cuba, the balloon's exterior varnish melted, making the sides stick together and tear. Once it was repaired, Maxfield was given only enough bottled hydrogen to inflate the balloon one time. Despite these setbacks, the detachment made multiple ascents on June 30, 1898, and was able to observe the surrounding terrain and Spanish ships in Santiago Harbor. To save on weight, they did not carry up the telegraph cable meant for communicating with men on the ground. Instead, they shouted or dropped messages tied to rocks.

The next day, the balloon experienced combat for its first and only time at the Battle of San Juan Hill. Maxfield was accompanied by Colonel George Derby, who insisted that the balloon be carried low over the American lines. Maxfield protested that the balloon would be better used high in the air, with a larger field of view, but Derby overruled him. From their position, Maxfield and Derby were able to pass on information about how heavily the Spanish positions were defended. They also located a trail through the jungle that helped American troops move more quickly. The balloon was an easy target, however, and it directed Spanish fire onto the troops beneath it. Novelist and war correspondent Stephen Crane described the scene when the balloon was eventually hit: "The front had burst out with a roar like a brushfire. The balloon was dying, dying a gigantic and public death before the eyes of two armies. It quivered, sank, faded into the trees amid the flurry of a battle that was suddenly and tremendously like a storm."[5]

Maxfield and Derby survived their misadventure, but the balloon was not repaired and never returned to the air. For the rest of the war, Maxfield managed laying telegraph lines in Cuba, and in 1899, he deployed to the Philippines to do to the same. He received commendation for how his work facilitated Army communications.

LEGACY: Maxfield's frustrating experience exemplified the challenges of early military ballooning. When the U.S. Army first obtained a balloon in July 1861, it became caught in tree branches enroute to the First Battle of Bull Run and thus did not see any action that day. Members of the Signal Corps recognized the value of aerial observation and reconnaissance, though, and continued to experiment with balloons and eventually airplanes. This persistence paid off, with the U.S. Air Force tracing its lineage to the Signal Corps Aeronautical Division established in 1907. Today, aerial observation and reconnaissance is mostly conducted by airplanes, drones, and satellites, but high-altitude balloons are still used to collect and transmit valuable data.

CAPTAIN
FRANCIS GARY POWERS

HONOR

WALKING TOUR STOP 4
Section 11, Grave 685-2

Captain Francis Gary Powers, undated. (NASM)

BIRTH: August 17, 1929, Burdine, KY

DEATH: August 1, 1977, Los Angeles, CA

EARLY & PERSONAL LIFE: Powers grew up during the Great Depression in Pound, Virginia. In 1950, he graduated from Milligan College in Tennessee. He then enlisted in the U.S. Air Force as an aviation cadet. He flew F-84s for the Air Force until January 1956, when he was recruited by the Central Intelligence Agency (CIA) to participate in the top-secret U-2 aerial reconnaissance program.

CAREER: Pilots in this secret reconnaissance program flew U-2 "spy planes" at 70,000 feet, a height the U.S. government believed undetectable by Soviet ground radar. Starting in 1956, U.S. pilots flew over Soviet airspace, photographing military installations and nuclear facilities. It was crucial to keep these missions secret because unauthorized entrance of Soviet airspace could be considered an act of war.

On May 1, 1960, Powers left on a reconnaissance mission over Soviet airspace. Despite the United States' belief that his U-2 was undetectable, Powers was shot down over the city of Sverdlovsk by a Soviet surface-to-air missile. Powers parachuted to the ground, where he was immediately captured by the KGB. The Soviets also recovered parts of the U-2, which, along with Powers' capture, definitively proved that the United States was spying on the USSR. The Soviet government took Powers prisoner, convicted him of espionage, and sentenced him to three years of imprisonment plus seven years of hard labor.

INTELLIGENCE
WALKING TOUR

Return to Sheridan Dr and turn left. Turn left again on Wilson Dr and continue on Memorial Dr. At Porter Dr, turn right. Turn left on McPherson Dr and stay left to continue on McKinley Dr. When the road forks, turn right into Section 11. Powers' grave is 6 rows from the end of the section and about 10 plots from the road.

The timing of these events greatly hurt American-Soviet relations. The nations were planning to meet in Paris in a few weeks to begin plans for a détente. However, Soviet leader Nikita Khrushchev, and the entire world, now knew that the United States was blatantly spying on the Soviet Union. Khrushchev had to act, or he would appear weak. He demanded that President Dwight Eisenhower apologize and promise to end the U-2 program, but Eisenhower refused. As a result, Khrushchev refused to attend the Paris summit.

Despite these tensions between the United States and Soviet Union, on February 10, 1962, the Soviet Union released Powers in a prisoner exchange for Colonel Rudolph Abel, a Soviet spy held by the United States. (The 2015 Steven Spielberg movie "Bridge of Spies" dramatized these events.)

After his return to the United States, Powers flew helicopters for radio and television stations in Los Angeles. He died in a helicopter crash on August 1, 1977, when the helicopter he was flying ran out of fuel and crashed. It was later revealed that the helicopter had a history of faulty gauges.

LEGACY: In 2000, the U.S. military posthumously awarded Powell the Prisoner of War Medal. At the time of Powers' capture, he had not been recognized as a POW because the United States was not engaged in armed conflict with the Soviet Union, and he was believed to have been working only for the CIA. In the late 1990s, however, declassified documents revealed that his mission had been a joint CIA-Air Force operation, thereby rendering him eligible for POW status.

Powers' capture and imprisonment revealed the danger of performing intelligence work. Although the U.S. government believed Powers' U-2 plane was untraceable by the Soviet Union, that intelligence was faulty and led to Powers' capture.

MAJOR STEPHANIE RADER

HONOR

WALKING TOUR STOP 5
Section 11, Grave 614-B

Rader in the 1940s. (CIA)

BIRTH: May 15, 1915, Toledo, OH

DEATH: January 21, 2016, Alexandria, VA

EARLY & PERSONAL LIFE: Stephanie Czech Rader was born to Polish immigrants in 1915. Her parents maintained a Polish household in both language and culture throughout Rader's childhood. Rader was academically gifted and excelled in languages. One of her teachers took notice of Rader's skills and submitted an application to Cornell University on Rader's behalf. Rader graduated from Cornell in 1937 with a chemistry degree. After graduating, she worked as a translator for the Texaco oil company in scientific studies. She married Brig. Gen. William Rader in 1946 and received her master's degree in chemistry from George Washington University in 1951.

CAREER: In 1942, Rader enrolled in officer school for the Women's Army Auxiliary Corps (WAAC), joining an elite group of women. Rader was a part of the first group of WAAC soldiers. In December 1944, Rader caught the attention of the OSS because of her familiarity with Polish language and culture, and she joined the OSS as an on-the-ground operative. Rader deployed to Warsaw, Poland in October

INTELLIGENCE WALKING TOUR

Return to McKinley Dr and turn right. After the road curves to the right three times, count back ten rows and turn right into Section 11. Rader is about 20 headstones in.

1945. She quickly became essential to intelligence gathering in the region. Under the guise of a U.S. embassy employee in Poland, Rader collected information about the concentration of Soviet troops, the activities of both German and Soviet security services, and socioeconomic and political insights, such as citizens' feelings toward different political leaders and countries. The United States' Cold War strategy entailed understanding Poland's economic health and Polish people's attitudes towards both the U.S. and the Soviet Union. Since the U.S. and the Soviet Union were not officially at war, traditional reconnaissance proved difficult and dangerous.

While in Poland, Rader had to be careful with whom she interacted. The Soviet Union controlled Poland, and demonstrating any preferences toward the West, or asking too many questions, could put a person in danger.

Rader's other tasks included couriering messages between Warsaw and Berlin. On one journey in January 1946, she was detained by Russian border officials. Sensing the inevitability of her detainment, she slipped the sensitive documents to a passenger next to her and gave them the location of a safe delivery spot in Warsaw. Rader was in the clear, but Soviet intelligence officers increased their surveillance of her. Unfortunately for Rader, in 1946 her cover was compromised by a superior in Paris. Still, she decided to stay in Poland for a few more weeks to finish her mission. Rader returned home and retired from the Army in 1946.

LEGACY: In 1946, Rader's superiors nominated her for the Legion of Merit. The War Department denied the request for unknown reasons. Rader received what is now known as the Army Commendation Medal in 1947. Upon the declassification of her personnel folder in 2008, efforts to award her the Legion of Merit resumed. After her death in 2016, the Army awarded Rader the Legion of Merit, just in time for her interment at Arlington National Cemetery.

WOMEN'S ARMY CORPS

In May 1941, as the U.S. edged closer to involvement in World War II, Congressional Representative Edith Nourse Rogers introduced a bill to create a volunteer women's corps in the Army. On May 15, 1942, President Franklin D. Roosevelt signed into law a bill that authorized the Women's Army Auxiliary Corps (WAAC). Within one year, 60,000 women had volunteered for service. Although these women thought of themselves as serving _in_ the Army, they were officially considered civilian volunteers who served _with_ the Army. This changed in July 1943, when the WAAC was converted into the Women's Army Corps (WAC). The key difference between the WAAC and the WAC was that members of the WAC were officially part of the Army, and therefore eligible for Army benefits such as veterans' medical coverage and legal protection as prisoners of war if captured while on duty. These protections enabled women to serve overseas. Members of the WAC were the first women to serve in the Army in non-medical capacities. More than 150,000 women served in the WAC during the war.

★ ELIZEBETH SMITH FRIEDMAN ★

BIRTH: August 26, 1892, Huntington, IN

DEATH: October 31, 1980, Plainfield, NJ

EARLY & PERSONAL LIFE: Famed cryptologist Elizebeth Smith Friedman was the youngest of nine children. A gifted student, she graduated from Hillsdale College with a major in English literature (and a passion for Shakespeare). She also had a talent for languages and studied Latin, Greek, and German. While Smith was working at Chicago's Newberry Library in 1916, George Fabyan, an eccentric millionaire businessman, recruited her to work at Riverbank Laboratories, his private think tank. During World War I, Riverbank served as the U.S. government's unofficial cryptologic laboratory. While working as a cryptologist there, Smith met her future husband, William F. Friedman, also known for his work in cryptology. They married in May 1917. In 1921, the Friedmans moved to Washington, D.C. to work for the War Department.

CAREER: Hired by the Treasury Department in 1924, Friedman assisted various Treasury agencies with codebreaking. In 1927, she was assigned to the Coast Guard to help fight the "Rum War" created by Prohibition. As part of this work, Friedman and her team intercepted and decrypted international smuggling and rum-running radio messages. Between 1927 and 1930, she is estimated to have solved over 12,000 messages in hundreds of different code systems, all by hand with just pencil and paper. Her work led to 650 federal prosecutions.

During World War II, Friedman led the team that broke codes generated by the Germans' formidable Enigma machine. She exposed a ring of German spies in South America, effectively denying them a foothold in the Western Hemisphere. According to the NSA, her cryptanalytic unit "was probably even more secret than other organizations because it dealt with counterespionage."[6] It was crucial that no one knew of her work. If her Nazi targets knew she was breaking their codes, they would switch to more complicated codes, and the United States would no longer know of their activities — at least until Friedman could break their new codes. After the war, Friedman retired from government service.

LEGACY: Called "America's first female cryptanalyst," Elizebeth Friedman pioneered the cryptology field. Because her work was classified, she received no credit during her lifetime for her lifesaving codebreaking in World War II. However, since her work was declassified in 2000, she has been increasingly recognized as one of the world's greatest cryptologists.

Elizebeth Friedman, undated. (NSA)

INTELLIGENCE
WALKING TOUR

Return to McKinley Dr and turn right. Turn left onto McPherson Ave and then right onto Clayton Dr. At the gate, turn left onto Patton Dr. Friedman's grave is in the last row, third from the left end.

Coast Guard Intelligence seal, undated. (USCG)

LIEUTENANT COLONEL WILLIAM FRIEDMAN

WALKING TOUR STOP 6
Section 8, Grave 6379-A

BIRTH: September 24, 1891, Chișinău, Moldova

DEATH: November 12, 1969, Washington, D.C.

EARLY & PERSONAL LIFE: Wolfe Frederick Friedman was born in Moldova, then part of the Russian Empire. Facing widespread anti-Semitism, he and his family immigrated to the United States in 1893. When Friedman became a U.S. citizen three years later, he changed his name to William. Friedman grew up in Pittsburgh, Pennsylvania. He attended Michigan State University for his undergraduate degree and was then awarded a scholarship to study genetics at Cornell University.

In 1915, George Fabyan hired Friedman as the head of the Department of Genetics at Riverbank Laboratories. There, he became fascinated with codes and ciphers, and also met his future wife, Elizebeth Smith, who worked in Riverbank's Department of Codes and Ciphers.

CAREER: When Congress declared war on Germany in April 1917, the military had no codebreaking infrastructure. In previous wars, codebreaking was not a high priority. Few messages were encrypted because intercepting messages – capturing a messenger or tapping a telegraph wire – was difficult. However, during World War I, radio was the primary form of communication and radio messages were relatively easy to intercept. Thus, the War Department had to look outside of the military. The solution was Riverbank, with William and Elizebeth Friedman leading the way. For the next eight months, the Friedmans' team at Riverbank was the only U.S. government codebreaking unit. During this time, the Friedmans invented the foundational strategies for modern cryptology, discovering new methods to decipher codes and writing guides on codebreaking.

William and Elizebeth Friedman, undated. (NCM)

Friedman (center) and his small SIS staff in 1935. (U.S. Army)

Can you find the hidden cipher on the Friedman's headstone?

Elizebeth chose to hide William's initials in the inscription "Knowledge is Power," using Bacon's cipher. While at Riverbank, Elizebeth and William were tasked to prove that Francis Bacon was the secret author of Shakespeare's works, something they later disproved.

Hint: Some letters in the epitaph are Serif font, while others are Sans-Serif.

In the fall of 1917, after the War Department created its own codebreaking unit, the Friedmans shifted from breaking the messages themselves to training new Army recruits in how to break codes. In May 1918, Friedman left for France as a first lieutenant in the Signal Corps to continue his codebreaking efforts closer to the frontlines.

During World War II, Friedman served as chief cryptologist for the Army Signal Intelligence Service (SIS). Friedman helped found this new codebreaking unit in 1930; it became the precursor for today's NSA. During the war, Friedman and his team worked to solve Japan's "Purple" cipher machine. Japanese diplomats in Germany used this machine to communicate with their government back home, so if Friedman and his team could solve these cipher machines, the United States would have intelligence on both Germany and Japan. In September 1940, after months of toil, his team broke the previously believed "unbreakable" Japanese Purple cipher. Cracking Purple gave the Allies a significant advantage which directly led to Allied victories in the Pacific. However, the strain of breaking the cipher nearly killed Friedman, and he struggled with depression for the remainder of his life.

LEGACY: William Friedman was a brilliant cryptanalyst who helped shape modern signals intelligence. Not only did he crack "unbreakable" codes and invent cryptology strategies that are still used to this day, but he also helped train a generation of cryptanalysts and wrote the foundational texts for the field.

CRYPTOLOGY

★   ★

EXPLORE

Elizebeth Smith Friedman and William Friedman pioneered the field of cryptology during the first half of the 20th century. They developed techniques of codebreaking that are still used today.

TERMINOLOGY AND BASIC RULES

- Code: a **fixed relationship** between two sets of things (words, ideas, symbols, etc.)
  - Nodding is code for "yes"; the code word for "ship" might be "flower"
- Cipher: a **rule** for altering letters in a message
  - If A=B, B=C, C=D, etc., then EXPLORE becomes FYMPSF
- The best way to crack codes and ciphers is to find patterns. Here are some rules to help find patterns in English-language messages:
  - 10 most common words: the, of, and, to, a, in, that, it, is, I
  - Most common letter: E
  - Most common three-letter group: THE
- William Friedman once said, "You can't convey much intelligence using only these words, and yet you can't construct a long, intelligible, unambiguous message without using them over and over again."[7]

"[T]he messages [were] like little onions, each layer created with a different technique that Elizebeth had to peel back: Starting with the ciphertext block MJFAX, she might have to decrypt it into another five-letter block, BARHY, which corresponded to 08033 in a widely available book of commercial codes used by legitimate businessmen to save on telegraph charges, from which she subtracted 1,000 to get 07033, which matched up with the English word ANCHORED in a second code book. 'If I may capture a goodly number of your messages,' she wrote, 'even though I have never seen your code book, I may read your thoughts.'"[8]

CRACK THE CODE!

A simple "rail fence" code that William wrote to Elizebeth:

I   E   R   O   U   !
L   V   Y   H   L   !
O   U   M   S   D   O
V   O   U   I   S   S
E   Y   C   H   A   Y

To crack the code, trace the letters along a repeating pattern to form a sentence.

CRACK THE CODE!

Here is one of the first messages that Elizebeth Friedman decoded for the Coast Guard. It was a relatively simple one-to-one substitution cipher. Using the cipher key she decrypted, decode the message:

AWJTSSK JQS GBQKWSK LYMSE EJBCG SPEC QPFYEYQD MYHGC

PRPYC JWKSWE CWI PQTGJW EPFS VBSM AWAJASTCE HJJK.

A = P	F = V	K = D	P = A	U = B	Z = X
B = U	G = H	L = M	Q = N	V = F
C = T	H = G	M = L	R = W	W = R
D = K	I = Y	N = Q	S = E	X = Z
E = S	J = O	O = J	T = C	Y = I

CAPTAIN
FORREST R. BIARD

**WALKING TOUR
STOP 7**
Section 60, Grave 6838

Biard, undated. (Station HYPO)

Station Hypo, undated. (NHHC)

BIRTH: December 21, 1912, Bonham, TX

DEATH: November 2, 2009, Dallas, TX

EARLY & PERSONAL LIFE: After graduating from North Dallas High School, Biard attended the U.S. Naval Academy. He graduated in 1934. In 1963, he married Winifred M. Wall.

CAREER: At the end of World War I, the U.S. military realized that Japan posed a growing threat to American interests in the Pacific. To respond to this threat, the military decided to create a Japanese language and culture training program. It was important for the military to have officers who could speak and read Japanese, as well as understand cultural norms and interpret Japanese intelligence. From September 1939 to September 1941, with World War II raging in Europe, Biard lived in Tokyo as part of this immersion program. He was one of the last individuals to participate. Three months after he left, Japan attacked Pearl Harbor and the United States entered World War II.

With the United States at war with Japan, Biard's Japanese language skills were now crucial to the military's intelligence efforts. The Navy assigned him to Station Hypo in Pearl Harbor as a senior linguist, charged with breaking Japanese codes. Biard worked in a basement office with a team of 12 men under Commander Joseph Rochefort. He said of the experience: "[W]ithout [Rochefort], we probably would have lost the war. Without any one of these twelve, we probably would have lost the war. … I am not saying that we in the basement won the Battle of Midway – we didn't. But, by gosh, we made it possible. I'm proud of it… I'm proud to have been a member of this marvelous little group that did so much for the country."[9]

INTELLIGENCE WALKING TOUR
Return to Patton Dr and turn right. Turn left onto Eisenhower Dr and then right on Bradley Dr. Just before MacArthur Dr, turn left into Section 60, three rows before the left curb ends. In this shorter row and towards the center of the section, Biard's gravesite is 12 plots from the end of the row.

"AF is Short of Water"

The Battle of Midway was a turning point in the Pacific during World War II. Before the battle, the Japanese navy moved from victory to victory. At Midway, the United States turned the tide of the Pacific war, and Japan spent the rest of the war trying to defend territory it had previously taken. Without the work of the cryptanalysts at Station Hypo, the U.S. Navy would not have been prepared for the battle.

By May 1942, cryptanalysts at Pearl Harbor and in Washington D.C. had cracked part of the Japanese code designated JN-25. Under Commander Joseph Rochefort, the cryptanalyst team determined that Japan was going to attack Midway in early June. Japanese code identified the target as "AF." Rochefort's team believed that AF was Midway. Trusting Rochefort's team, Admiral Chester Nimitz, commander in chief of the U.S. Pacific Fleet, immediately began to position his forces for battle at Midway.

But cryptanalysts in Washington D.C. argued that "AF" was a different location. At Rochefort's prompting, Nimitz directed the commanding officer at Midway to send a fake message that the island's water plant was damaged and needed fresh water. The Japanese soon sent an encrypted message that "AF is short of water." With the location confirmed, Nimitz prepared for the impending battle.

In February 1944, Biard traveled to Brisbane, Australia to decrypt messages encoded in Japanese Army code books found in New Guinea. The decrypted communications detailed Japanese defensive plans in that southwestern Pacific island. This information helped U.S. General Douglas MacArthur anticipate Japanese movements and reclaim New Guinea in just a few weeks. While serving on the USS Wasatch in New Guinea and the Philippines, Biard was awarded the Bronze Star for capturing and interrogating prisoners from ships sunk during the Battle of Leyte Gulf.

After World War II, Biard studied nuclear engineering, nuclear physics, and radiation hazards. He served as the operations officer for the first hydrogen bomb test at Bikini Atoll. Biard retired from the Navy in 1955.

LEGACY: Biard's career demonstrates the importance of language experts in intelligence work. A decrypted message is useless if no one can translate it. A postwar assessment of Station Hypo stated, "The fate of the nation depended quite literally on a dozen men who had devoted their lives and their careers in peace and in war to radio intelligence."[10] Biard was one of those 12.

JENNIFER MATTHEWS & ELIZABETH HANSON

HONOR

WALKING TOUR STOP 8
Section 60, Grave 8978

On December 30, 2009, a suicide bomber attacked a military base in Khost, Afghanistan. The attack killed 12 CIA agents and contractors. Two of the agents killed in the attack were Jennifer Matthews and Elizabeth Hanson. Matthews' and Hanson's careers highlight important CIA/civilian contributions to national and military intelligence.

JENNIFER MATTHEWS, Section 59, Grave 3751

BIRTH: December 6, 1964, Penbrook, PA

DEATH: December 30, 2009, Khost, Afghanistan

Matthews graduated in 1986 from Cedarville University with degrees in broadcast journalism and political science. Shortly after graduation, she married Gary Anderson.

In 1989, the CIA hired Matthews as an intelligence analyst. Matthews interpreted arial photographs from Iran, tracking potential military or insurgent buildups. In the mid-1990s, she was assigned to Alec Station in Washington D.C. to track Osama bin-Laden and other al-Qaeda associates. In this new role, Matthews used surveillance tools, such as Predator drones, to track terrorist groups and identify which groups posed real threats to U.S. interests. At this time, al-Qaeda was evolving from an organization that had supported Afghanistan in its war against the Soviet Union to a more radical group committed to waging a "holy war" across the Middle East. Matthews' surveillance work helped the intelligence community identify al-Qaeda as a rising threat.

Matthews' work escalated after the 1998 al-Qaeda bombing of two U.S. embassies, one in Kenya and the other in Tanzania. It was the terrorist attacks on September 11, 2001, however, that haunted Matthews. She and others who tracked al-Qaeada felt guilty about failing to stop the attacks. Regardless of her guilt, Matthews continued to track al-Qaeda, as it had now established itself as a major terrorist threat and a top priority for the CIA and military to neutralize.

After a post in London in 2005 as a counterterrorism liaison to the British intelligence services, Matthews received a one-year assignment tracking down al-Qaeda leaders in Khost, Afghanistan. She started as the chief of Forward Operating Base Chapman in April 2009. It was in this position that she crossed paths with Elizabeth Hanson.

ELIZABETH HANSON, Section 60, Grave 8978

BIRTH: February 14, 1979, Rockford, IL

DEATH: December 30, 2009, Khost, Afghanistan

After graduating from Colby College in 2002, Hanson joined the CIA as part of its post-9/11 hiring surge. She was 26 at the time. Her mother described her as a person who craved adventure and excitement, attributes she associated with Hanson's decision to join the CIA.

With the threat of al-Qaeda established, Hanson worked as a targeter for the agency. She scoured surveillance footage and analyzed emails, wiretaps, reports from informants, and internet chat boards to identify terrorists on the CIA's wanted list — their faces, locations, and daily habits. Hanson then shared this information with her supervisors, who decided which actions the agency should take against the target.

Hanson participated in several important cases at the agency, including the 2009 killing of Osama al-Kini (the chief of al-Qaeda in Pakistan). In August 2009, Hanson transferred to the CIA's Kabul station as part of a push to find and eliminate al-Qaeda's remaining leaders. It was from here that she was summoned to Khost, a base designed for work with undercover operatives, for a meeting with an informant.

JENNIFER MATTHEWS & ELIZABETH HANSON

THE MISSION IN KHOST:

In 2009, the U.S. was on the hunt for Osama bin Laden and his supporters. The CIA led the charge on tracking and taking out these high-level targets. In December 2009, the CIA selected its base at Khost for an informant meeting with Humam Khalil al-Balawi, a highly valued al-Qaeda double agent.

Earlier that year, the Jordanian Mukhabarat (intelligence service) turned Balawi as a double agent, after arresting him for writing pro al-Qaeda articles on jihadist internet forums. With the promise of money and his family's protection, Balawi traveled to Pakistan to infiltrate the Taliban, posing as a devout physician who wanted to treat the organization's sick and wounded.

The Taliban was desperate for doctors, so Balawi had little trouble gaining access to the organization. However, once he had infiltrated the Taliban, Balawi turned triple agent. It is unclear whether this was of his own initiative or because the Taliban discovered his deception. The Taliban decided to use Balawi to capture the United States' interest. They recorded footage showing Balawi in the same room as Atiyah Adb al-Rahman — one of the closest associates of Osama bin Laden known to be alive at the time — which Balawi then shared with the CIA.

Al-Rahman was one of the United States' most desired targets. The CIA quickly began trying to organize a meeting with Balawi; they needed to know more about this agent whom no CIA agent had ever met. CIA leadership tasked Matthews to create a plan to secretly bring Balawi to her base in Khost and then return him to the Taliban with no one the wiser. During this time, a few individuals raised fears that Balawi had turned into a jihadist, and one person remarked that his intelligence was "too good to be true."[11] However, the promise of Balawi's intelligence largely caused the CIA to overlook these security concerns.

When Balawi arrived at the base for the informant meeting, he was greeted by about 14 agents and military personnel. Balawi stepped out and detonated the C4 explosives stuffed in his vest. Both Matthews and Hanson, as well as ten other CIA agents and contractors, were killed in the explosion.

The director of the CIA attended the funerals of both Matthews and Hanson, and the CIA added Matthews to its Book of Honor. Though they began their service in different eras with different jobs, both Matthews and Hanson helped shape the war on terror through intelligence work.

Afghanistan and surrounding region, 2022. (Google Maps)

Darren Labonte and Scott Roberson, who were killed in the Khost attack, are also buried at Arlington.

SPC (ARMY) DARREN JAMES LABONTE,
Section 40, Grave 96

October 10, 1974-December 30, 2009

SCOTT ROBERSON,
Columbarium 9/S05/13/1

July 3, 1970-December 30, 2009

PRIVATE
JAMES W. PRYDE

HONOR

**WALKING TOUR
STOP 9**
Columbarium 9/N43/18/1

BIRTH: August 18, 1926, Washington, D.C.

DEATH: August 10, 2017, Washington, D.C.

EARLY & PERSONAL LIFE: Little is known about James Pryde's early life beyond his passion for a single goal: becoming a pilot. With World War II raging in Europe, Pryde read dozens of newspaper articles about the monumental work of the all-Black Tuskegee Airmen. Determined to add his name to the list of brave pilots fighting in Europe, Pryde enlisted in the Army Air Corps in 1943, at 17 years old.

CAREER: Much to Pryde's dismay, the Army assigned him to flight crew mechanic and radio operator training instead of flight school, thus ending his dreams of becoming a pilot. Yet this would lead to a path beyond his original goal. After World War II, Pryde joined the Armed Forces Security Agency, a precursor to the National Security Agency (NSA). He started as a communications clerk in a segregated division, where he learned to read Morse code. Because of this skill, the NSA reassigned Pryde to a new field of weapons signals analysis, called telemetry. Pryde soon became an expert telemetry analyst.

James Pryde, undated. (NSA)

INTELLIGENCE
WALKING TOUR
Return to Bradley Dr and turn left. Turn left on Nimitz Dr. Turn right onto York Dr and immediately turn right to enter the Columbarium. At the first wall on the left, Pryde's niche is in the bottom row.

Pryde specialized in a type of intelligence gathering called Signals Intelligence, or SIGINT. Intelligence information provided by SIGINT comes from interpreting enemy electronic systems, such as radar and communication systems. He used intercepted signals to reverse engineer what those signals were reporting, which then allowed him and other analysts to learn about various enemy actions. Pryde and his co-workers could thus determine information such as missile designs and where enemy nations' space programs were sending their astronauts and equipment.

Much of Pryde's work in SIGINT remains highly classified. Before his retirement in 1981, he served in several high-ranking positions within the NSA. Pryde worked on the staff of the assistant secretary of defense for two years and then as the director of the Defense Special Missile and Astronautics (now Aerospace) Center (DEFSCMAC) from 1978 to 1980. DEFSMAC is responsible for collecting intelligence on foreign missiles and satellites and providing time-sensitive alerts and assessments to the intelligence community. Pryde also served as the NSA representative to the Department of Defense in 1980 and as the assistant deputy director of administration at NSA in 1981.

LEGACY: Pryde is remembered in the military intelligence field for two main reasons. First, his work in SIGINT greatly contributed to gathering intelligence on the Soviet Union during the Cold War — likely on Soviet technologies and their space and missile programs. Perhaps his greatest contribution, however, was his dedication to increasing diversity within the NSA. As he gained leadership, he used his influence to share his experiences as an African American and to raise awareness about the need for more diversity in the intelligence community. To this end, Pryde frequently shared his experiences as a Tuskegee Airman who served in a segregated military. He was inducted into the NSA Cryptological Hall of Honor in 2006.

NOTES

1. Quoted in "Ask Alma's Owl: The 'Father of American Intelligence'," Columbia News, June 28, 2017, https://news.columbia.edu/news/ask-almas-owl-father-american-intelligence.

2. Quoted in Evan Thomas, "Spymaster General: The adventures of Wild Bill Donovan and the 'Oh So Social' O.S.S.," Vanity Fair, March 3, 2011, https://www.vanityfair.com/culture/2011/03/wild-bill-donovan201103.

3. Quoted in Thomas, "Spymaster General."

4. The provisions of Executive Order 12333 of Dec. 4, 1981, https://www.archives.gov/federal-register/codification/executive-order/12333.html#1.1.

5. Stephen Crane, "The Price of the Harness" in Wounds in the Rain: War Stories (New York: Frederick A. Stokes Company, 1900), 13.

6. Quoted in Jason Fagone, The Woman Who Smashed Codes (New York: Harper Collins, 2017), 264.

7. Quoted in Fagone, The Woman Who Smashed Codes, 188.

8. Quoted in Fagone, The Woman Who Smashed Codes, 137.

9. Forrest Biard, "Presentation by Captain Forrest Biard: 'Breaking the Japanese Codes and Decisive Results Pre-Pearl Harbor Through Midway'," audio, National Museum of the Pacific War, June 14, 2000, https://digitalarchive.pacificwarmuseum.org/digital/collection/p16769coll1/id/1298/.

10. Quoted in "Capt. Forrest R. Biard USN (Ret)," Dallas Morning News, November 8, 2009, https://obits.dallasnews.com/us/obituaries/dallasmorningnews/name/forrest-biard-obituary?id=23862115.

11. Quoted in Joby Warrick, The Triple Agent: The Al-Qaeda Mode who Infiltrated the CIA (Anchor Books: New York, 2012), 125.

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