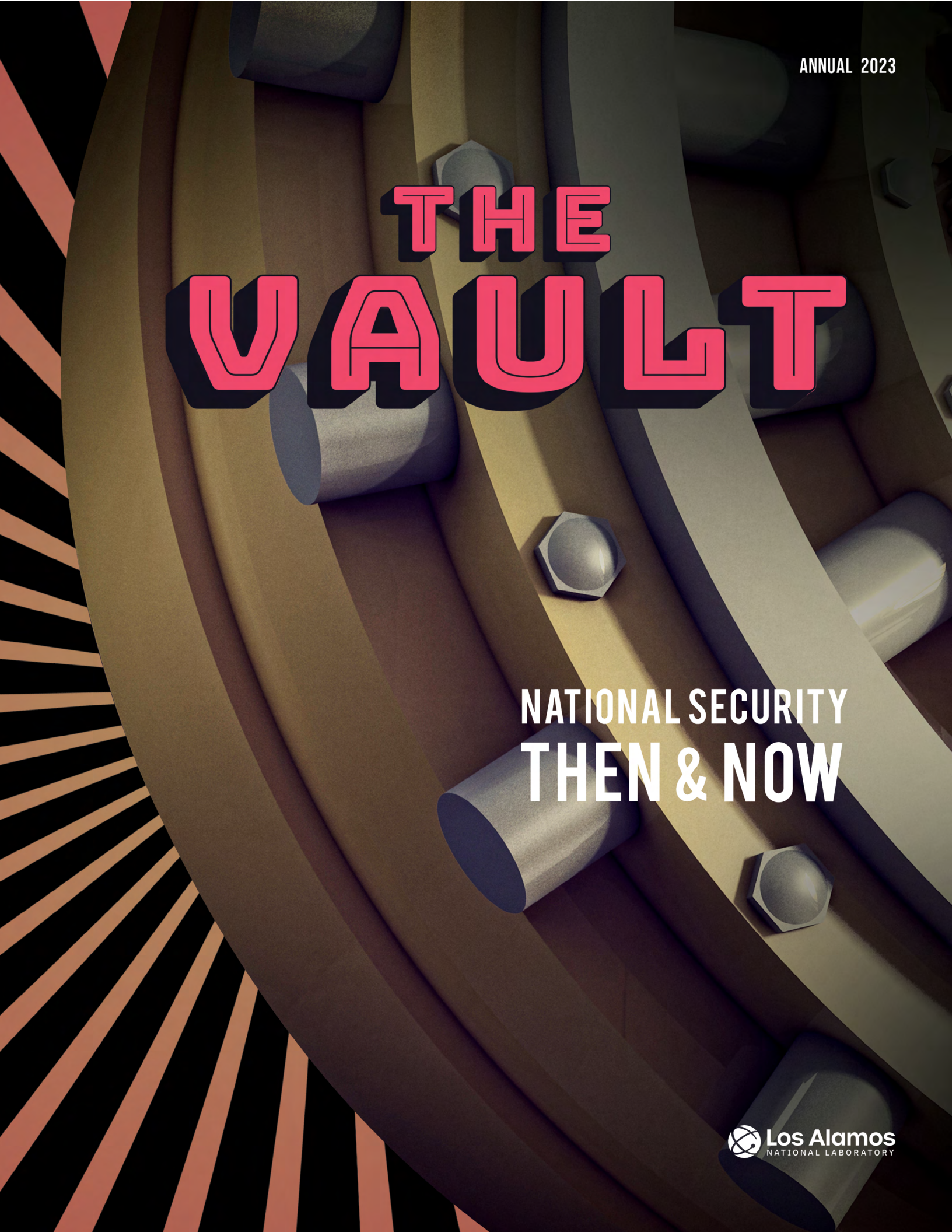

ANNUAL 2023
THE VAULT
NATIONAL SECURITY
THEN & NOW
Los Alamos
NATIONAL LABORATORY

LETTER FROM THE NSRC DIRECTOR

This year, Los Alamos National Laboratory celebrates its 80th anniversary. It's nothing short of incredible that, since 1943, our scientific innovation has changed the world. And, even more so, that we still do this today.

Commemorating this milestone has prompted me to think about the role the National Security Research Center plays in the Lab's national security mission, in particular as I assume my new position as the NSRC director.

Though new in this job, I can say with certainty that the NSRC is just as important today as it was when we began as J. Robert Oppenheimer's technical library.

The NSRC was founded in 2019, but our legacy long precedes us. Our roots date back to the Lab's beginning, when Oppenheimer and his team convened on the Pajarito Plateau as a part of the U.S. government's top-secret efforts to help end World War II. In just 27 months, they developed the first atomic bombs, laying the groundwork for national security as we know it.

As the first of what would amount to millions of records today were produced, Oppenheimer recognized the importance of curating these materials. To ensure their preservation as well as the access and transfer of knowledge, Oppenheimer handpicked Charlotte Serber for the mission-critical role of overseeing his technical library (see page 18). She was the only woman on his senior-level staff. Serber built the collections while managing the top-secret materials being created in real time—information that is still used.

Oppenheimer's classified library continues to fill a critical role in the national security landscape. Our highly trained, expert staff are leading the way for research libraries through innovative stewardship of the vital information in our collections, including the important work of restoring decades-old materials and expanding our digital, classified reading room.

We've evolved these past 80 years, both by growing our collections for the benefit of those working in national security and by fulfilling a commitment to educate broadly through numerous endeavors, like this annual magazine, podcasts, oral histories, articles, presentations, books, and a documentary on Oppie himself (see facing page).

As the Lab commemorates this anniversary and as I execute my new role in the NSRC, I am reminded that an understanding of our past—be it the technical knowledge or the unique history—is an important part of carrying forward the work that our predecessors began.

That work was important then, and current headlines reinforce it's no less important today. The NSRC is critical to the Lab's national security mission success.

Oppenheimer once said, "It is a profound and necessary truth that the deep things in science are not found because they are useful; they are found because it was possible to find them."

I think Oppenheimer would agree this is aptly descriptive of today's NSRC. And I think he would be very proud.

Brye Ann Steeves

Brye Ann Steeves
Director, National Security Research Center

OPPENHEIMER

SCIENCE MISSION LEGACY

nsrc.lanl.gov

The true story of J. Robert Oppenheimer and his transformative achievements **as only Los Alamos can tell it.** See how it all happened—from his contributions to the Manhattan Project to his legacy that continues to inform Los Alamos National Laboratory's scientific advancements and national security mission.

The innovations that first emerged in 1943 to today's cutting-edge technology are all a part of Oppenheimer's story. With expert interviews, archival footage, and cinematographic storytelling, this NSRC documentary sheds new light on the scientist and the history that he made—and the history that made him.

Scan to watch.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

CONTENTS

PRINT TO Digital

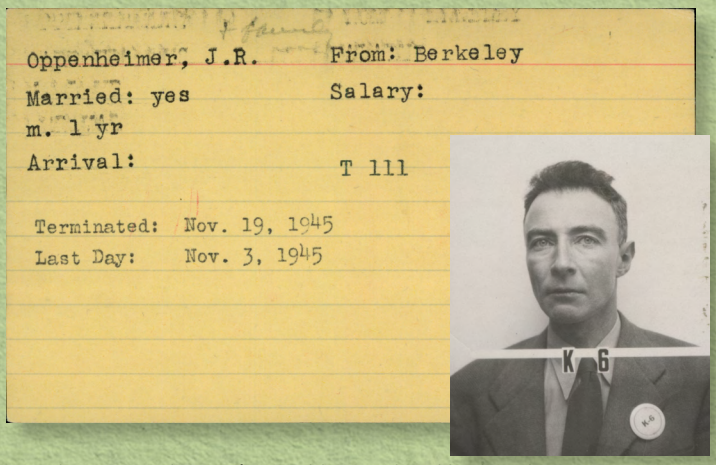
PRESERVING OVER 10,000 MCKIBBIN CARDS

By Julie Miller, librarian-archivist, National Security Research Center

The now 80-year-old McKibbin cards—used to record the personnel information of Manhattan Project staff, including famous scientists such as J. Robert Oppenheimer, Richard Feynman, Emilio Segrè, and Edward Teller—can now be accessed electronically thanks to a months-long effort to digitally preserve these pieces of the Lab's earliest history.

Collections management staff from the National Security Research Center (NSRC) recently digitized more than 10,000 McKibbin cards to make them available on the Lab's unclassified network, according to former NSRC collections manager Patricia Cote. The cards, named after their issuer Dorothy McKibbin, who was known as the gatekeeper of Los Alamos because she was often the first point of contact for new hires, have become symbolic of the Manhattan Project era at the Lab, when the world's greatest minds secretly gathered to create the first atomic bomb and end World War II. McKibbin cards are index cards that were used between 1943 and 1952 to document information such as an employee's name, marital status, and dates of arrival and departure. Many cards include more details such as salary, address, work location, and family information. McKibbin created each index card with a mechanical typewriter.

Dorothy McKibbin at work in her Santa Fe office. She was employed at the Lab from 1943 until her retirement in 1963.

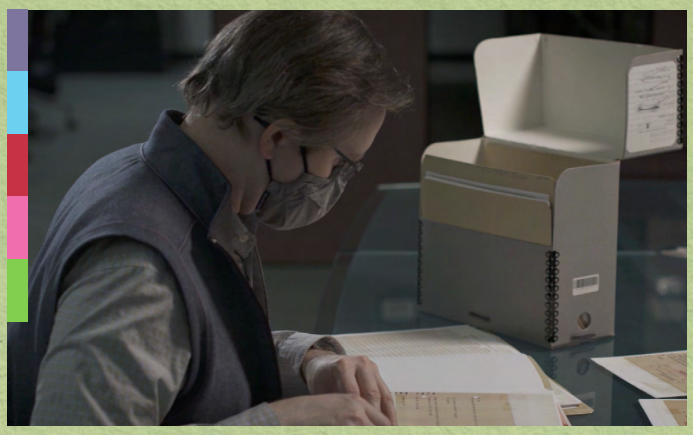


J. Robert Oppenheimer's McKibbin card and badge photo. Oppenheimer was the Lab's first director.

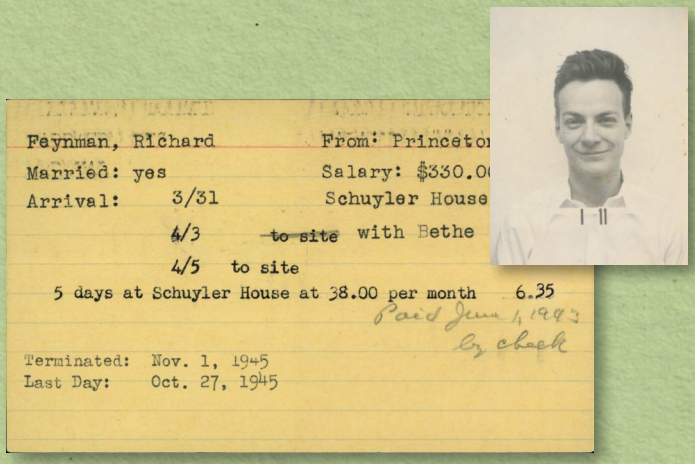
McKibbin worked as a secretary to J. Robert Oppenheimer in an office in Santa Fe. "We hear a lot about the scientific history of the people of the Manhattan Project era," said Cote. "The McKibbin cards provide a personal, more human perspective on these individuals. Plus, they are among the Lab's oldest unclassified records. Preserving these relics means preserving our history."

WHY DIGITIZE THE MCKIBBIN CARDS?

Digitization provides access to the information on the cards while minimizing handling of the fragile and valuable original documents, which could be damaged by exposure to light, humidity, and contact with human hands and germs. Every direct interaction with archival records reduces



NSRC historian Nic Lewis works to preserve the Lab's legacy through its unique collections, which include McKibbin cards from the 1940s.

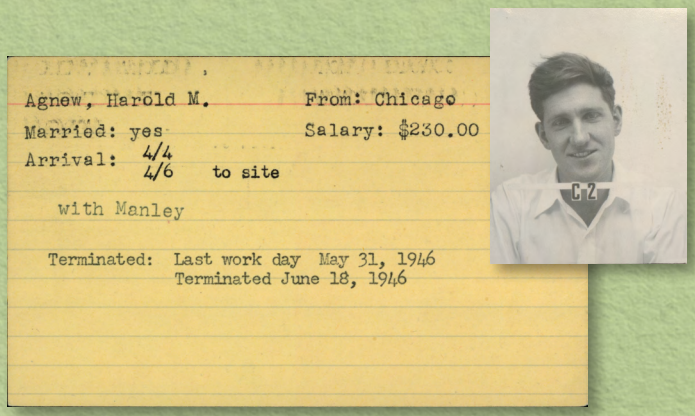


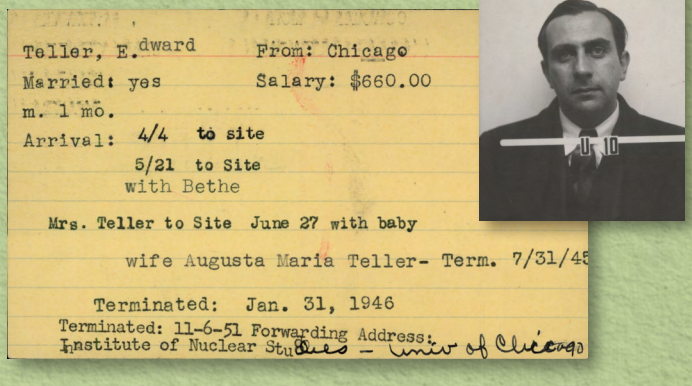
their life span. Because digitization is such a specialized and labor-intensive process, most of the NSRC's tens of millions of materials exist in physical form only; materials are prioritized for digitization as staff rediscover valuable information, such as the McKibbin cards, while searching the physical collections.

WHO USES THESE?

NSRC staff routinely reference the McKibbin cards as primary source material to obtain background information for research and publications. For example, approximately 50 McKibbin cards were accessed by researchers for an NSRC book on the Lab's Manhattan Project–era Nobel laureates, published in 2023.

NSRC archivist Angie Piccolo, librarian Laura McGuiness, and director Brye Steeves review legacy materials from the Lab's collections. Curation and accessibility of these items ensures history is preserved.





HOW WAS THE DIGITIZATION PROJECT COMPLETED?

Diego Corral-Ramos, a collections management contractor, conducted the digitization project, and Miranda Vigil, collections management staff, cataloged the collection. The NSRC's then-lead archivist Hadley Hershey provided technical support.

HOW CAN I ACCESS THIS INFORMATION?

Right now, there isn't a plan to release the entire collection; the digitized McKibbin cards are available to the NSRC staff, who can access them for research requests as needed.

Looking for more legacy items from the Manhattan Project era? Scan to see the badge photos of more than 1,400 of the Lab's Manhattan Project workers, including our most famous scientists.

Early Lab Love Stories

By Patty Templeton, collections manager, National Security Research Center

Edith Warner and Tilano Montoya

During the Manhattan Project, Edith Warner ran a tea room open only to Los Alamos staff—but she didn't do it alone. Warner baked cakes and served scientists while Tilano Montoya procured well water, fed the woodstove, and assisted as needed. Their regulars included pseudonym-using physicists like Lab Director J. Robert Oppenheimer, Niels Bohr, and Enrico Fermi.

Warner and Montoya met when he built her an adobe fireplace in 1928. Soon after, they were roommates. Warner was in her mid-30s, unmarried, and the freight agent for the Los Alamos Ranch School, a private school on the mesa that became the site of the laboratory. For $25 a month, Warner secured shipments at the Chili Line's Otowi Crossing stop. The tea room was her side business, until scientists from the hill made it her mainstay.

Courtesy of Palace of the Governors Photo Archives (NMHM/DCA), unknown photographer, negative 047541.

Twenty years her senior, Montoya was a former San Ildefonso Pueblo governor who had danced his way across Europe with a group of San Ildefonso performers. Montoya was known for his fine carpentry, kindness, and storytelling.

They ran the tea room through 1946, though World War II ended in September 1945 and many of their most famous diners had left Los Alamos.

In the decades they spent together at Otowi Crossing, Warner and Montoya never publicly shared whether theirs was a platonic or romantic partnership. In 1951, Warner died of cancer. Before she passed on, Warner mail-ordered two years' worth of blue jeans from Montgomery Ward for Tilano. He passed away almost exactly two years later.

Laura and Enrico Fermi

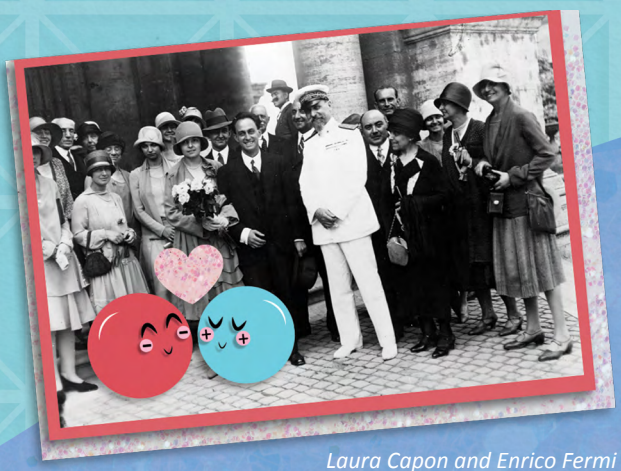
In 1927, physicist Enrico Fermi told a friend that " . . . he felt like doing something out of the ordinary, something definitely extravagant: either to buy a car or to take a wife," according to *Atoms in the Family.*

To Laura Capon's disappointment, Fermi bought a yellow Peugeot Bébé. Her worry was for naught, as Fermi soon proposed—though he was late for the wedding due to sewing his own shirt sleeves.

Fermi taught theoretical physics at the University of Rome, where he conducted the experiments that led to his 1938 Nobel Prize in Physics. Also in 1938, Nazi-allied Italy passed its first antisemitic laws. Laura and the children were Jewish, though the children's passports identified them as Catholic.

The Fermis decided to emigrate to America, and Enrico accepted a position at Columbia University. To secure travel, Fermi lied to Italian officials, stating that he had a six-month teaching sabbatical. On December 6, 1938, the family departed by train for Stockholm, where Enrico would collect his Nobel Prize.

Recounted in Laura's 1954 memoir *Atoms in the Family,* a German checkpoint guard stood "stiff and official, a personification of our past and present anxieties." Young Nella Fermi loudly asked what took so long, what was wrong, and, "Would the man send them back to Rome and Mussolini?"



Laura Capon and Enrico Fermi (1st row, left and center) on their wedding day in 1928. (Photo courtesy University of Chicago Photographic Archive, [apf1-09734], Hanna Holborn Gray Special Collections Research Center, University of Chicago Library.)

Fermi asked to assist the guard. He turned pages until a visa appeared. The guard relaxed. The Fermis continued to Stockholm. Afterward, they boarded the *Franconia* for America, arriving on January 2, 1939.

In 1942 at the University of Chicago Met Lab, Fermi supervised the first self-sustaining nuclear reaction (Chicago Pile-1), an important precursor to atomic bomb research at Los Alamos. In 1944, Oppenheimer recruited him to be associate lab director at Los Alamos and Laura to assist Dr. Louis Hempelmann in the Health Group.

As soon as Enrico was allowed to share his work at Los Alamos with Laura, he did. Handing her a book, he said, "It may interest you to see the Smyth Report. It contains all declassified information on atomic energy. It was just released for publication, and this is an advance copy."

Arline and Richard Feynman

Before Richard Feynman was a bongo drum–obsessed, Nobel Prize–winning theoretical physicist, he was a 15-year-old kid from Far Rockaway, New York, who fell in love with a girl named Arline Greenbaum.

During their courtship, doctors diagnosed Arline with terminal tuberculosis. The couple wed anyway, in June 1942, not long before Feynman was recruited for Project Y, the top-secret Los Alamos lab of the Manhattan Project. Oppenheimer secured a room for Arline at Southwest Presbyterian Sanatorium in Albuquerque, and the couple arrived soon after, in March 1943. Every weekend, Feynman made the 200-mile round trip to see Arline. Between, they wrote one another, often in code or jigsaw puzzle pieces, which infuriated wartime censors checking the mail.

In May 1945, Arline flooded Los Alamos with fake newspapers. Feynman recounted in a biography, "The whole damn place was full of them—hundreds of newspapers. You know the kind—you open it up and there's this headline screaming in thick letters across the front page: ENTIRE NATION CELEBRATES BIRTHDAY OF R. P. FEYNMAN!" A month later, Richard wrote her, "This time will pass—you will get better. You don't believe it, but I do." Ten days later, Arline's father called for Feynman to come quickly. Feynman borrowed a car from his friend (and later-confirmed Soviet spy) Klaus Fuchs. He picked up two hitchhikers in case he needed help changing a flat tire. He got three, with the last flat 30 miles outside of Albuquerque. He hitchhiked the rest of the way and made it in time to say goodbye. Arline died on June 16, 1945.

After Feynman's death in 1988, biographer James Gleick found a well-worn letter from Feynman to Arline, dated October 17, 1946. In it, Feynman wrote, "I find it hard to understand in my mind what it means to love you after you are dead—but I still want to comfort and take care of you—and I want you to love me and care for me. I want to have problems to discuss with you—I want to do little projects with you." He continued, "I am alone without you and you were the 'idea-woman' and general instigator of all our wild adventures."

Shared with permission from Michelle Feynman and Carl Feynman.

Rare Film of Marjorie Hall & Hugh Bradner Marriage

Because of the insular, isolated nature of life in Los Alamos during the Project Y era, weddings were often a community affair.

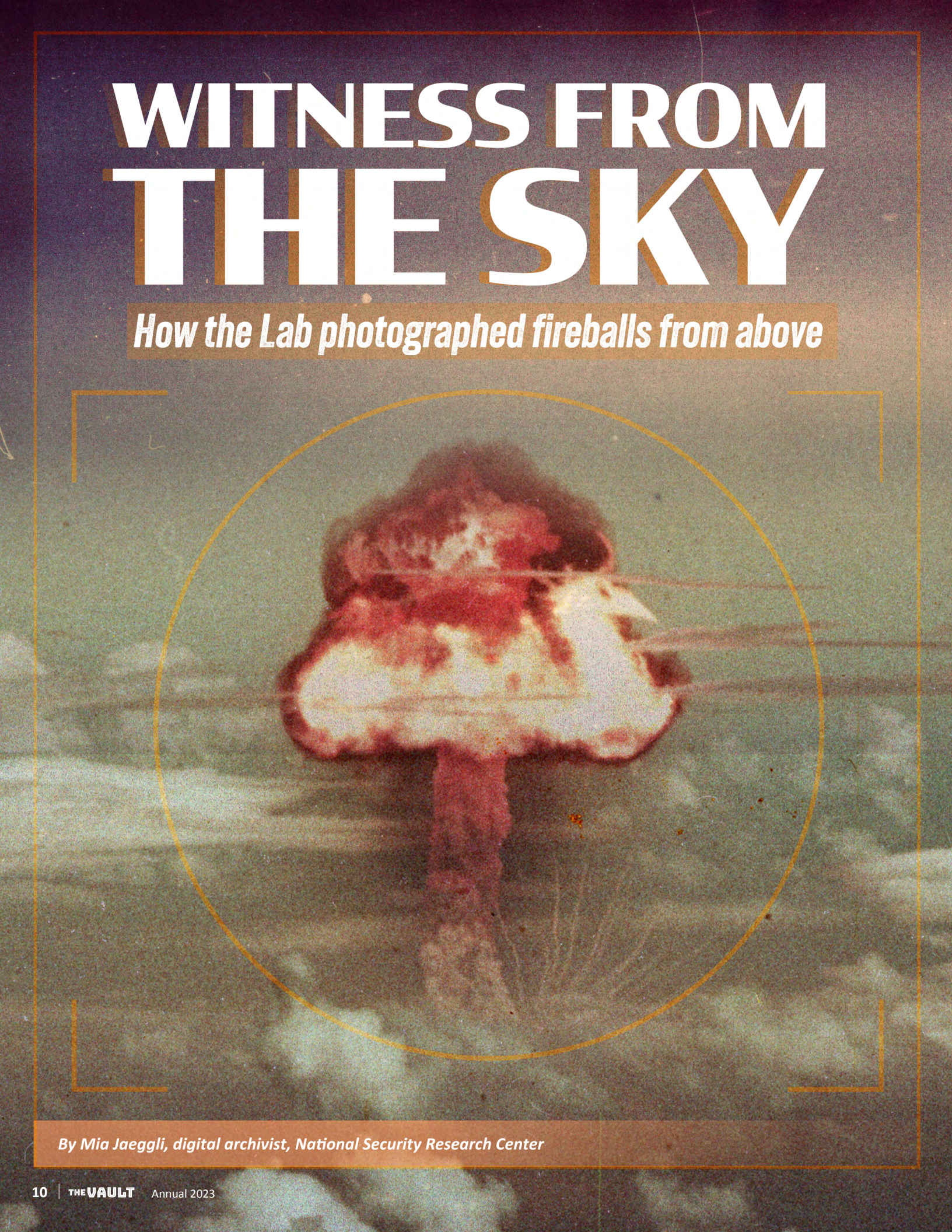
One celebration of a match-made-on-the-mesa occurred at the home of Dorothy McKibbin, secretary for J. Robert Oppenheimer. Marjorie Hall, a newly arrived secretary, and Hugh Bradner, a physicist, met and fell in love in McKibbin's office. They were married at McKibbin's house in September 1943.

Although weddings were often held at McKibbin's home, there are not many photos from these events. Thanks to a home movie preserved by the Lab's National Security Research Center, we can catch a rare glimpse of the Hall-Bradner nuptials.

Scan to watch the celebration.

WITNESS FROM THE SKY

How the Lab photographed fireballs from above



By Mia Jaeggli, digital archivist, National Security Research Center

In the spring of 1948, a workforce of more than 10,000 converged on three islands of Enewetak Atoll, part of the Pacific Proving Grounds. Lines of men hauled hundreds of pounds of state-of-the-art photographic equipment onto an array of aircraft. Their objective was to capture a series of nuclear tests—called Operation Sandstone—from the sky.

The cameras needed to be secured and a network of timing systems set as the first test, codenamed "X-ray," rapidly approached. Instead of guns on these military aircraft, the "planes appeared to have a hundred eyes," intoned the narrator of an Operation Sandstone documentary. This scene, which first played out during the 1946 Operation Crossroads Baker test, would repeat itself across decades of nuclear tests. Through their unique relationship with the explosion, the aerial surveyors were able to capture stunning photographs as planes flew around and above while shutters rapidly clicked.

While aerial images of fireballs and mushroom clouds from the weapons testing era are breathtaking, they also provide measurable—and irreplaceable—visual data that are as critical to research now as during the decades of nuclear testing.

"In the absence of weapons testing, these photos are absolutely vital today," said Nanette Mayfield, Digital Collections group leader, National Security Research Center (NSRC). "Researchers rely on them for their national security work. Understanding past weapons tests helps scientists working on our nation's stockpile, among other aspects of the Lab's national security mission."

As such, the NSRC is digitizing aerial test shot photographs by request and for publication projects. According to Tim Goorley, deputy director of the Strategic Analyses and Assessments Office, these photos are "evidence of the physical phenomena that occur during a nuclear detonation—proof of what really happens."

As one example, Goorley said, images of the Nagasaki explosion provide visual information as to the different components of a mushroom cloud: the pure white "detonation debris cloud . . . of condensed water" and the "dirty cloud" made up of dirt and debris from the ground.

The National Security Research Center is digitizing aerial photographs, such as this image from Operation Dominic-Yeso (1962), that remain scientifically important as evidence of the physical phenomena that occur during a nuclear detonation.

Aerial images such as this one, which captured the aftermath of the July 16, 1945, Trinity test in the New Mexico desert, provided a baseline for analyzing the impact of future nuclear bombs.

The Operation Crossroads Baker test, shown in time lapse from a high-speed camera like the Fastax. Aerial images from the 1946 Crossroads tests reveal much about shock waves and cloud formation.

The mixing of the two clouds, or lack of mixing, indicates the possible extent of fallout, or radioactive particles in the air after a detonation. Meanwhile, an aerial photo from the Operation Crossroads Able test "shows [that] the shock speed in the water is faster than the shock speed in air."

From blast to cloud

During atmospheric nuclear testing operations, photo planes carried a breadth of aerial mapping and military-type reconnaissance cameras. The KC-1, K-17, K-24, and high-speed 16-mm Fastax, which shot 3,000 frames per second, all simultaneously captured the evolution of a blast from detonation to the tops of the clouds. Their purpose was to measure yield, altitude, and diameter.

Two aerial photographers working during Operation Crossroads in 1946. (Photo courtesy of the Defense Threat Reduction Information Analysis Center and Peter Kuran.)

The bird's-eye view provided by aerial photography became essential as testing moved to higher altitudes and camera technology improved. In nuclear testing, weather was a variable factor, especially over the Pacific Ocean, where a large volume of testing took place, and unexpected heavy clouds often obscured ground views of atmospheric tests. A 1962 preliminary report from U.S. defense contractor Edgerton, Germeshausen, and Grier (EG&G) confirms the limitations of terrestrial cameras while affirming that photographs taken from a C-130 aircraft provided "excellent images of [mushroom] clouds." EG&G was the Lab's technical consulting firm, whose innovations in high-speed photography and timing systems made more advanced visual data collection possible.

Human element

Taking photographs from a plane had its challenges. According to Peter Kuran, nuclear testing documentary filmmaker and author of *How to Photograph an Atomic Bomb,* photographers and aircrew worked in open, depressurized planes at high, frigid altitudes. The extreme conditions didn't rattle the aircrew as much as the blast shockwaves did, according to Kuran. Planes flew as close as 6 miles from the detonation at an altitude of 11,000 feet, and despite their colleagues' forewarnings, the shockwaves that slammed into their planes unnerved the crews. "The first time was the one that forever stayed in their memories," Kuran said.

LANSCE CELEBRATES 50 YEARS

nsrc.lanl.gov

Lab physicist Louis Rosen proposed building the world's most advanced nuclear science facility at Los Alamos. On June 9, 1972, the facility's linear accelerator achieved its full design energy of 800,000,000 electron volts for the first time. Since then, LANSCE (the Los Alamos Neutron Science Center) has contributed to a range of national security work by Los Alamos scientists. Milestones from LANSCE's five decades of operation are preserved in the National Security Research Center, the Lab's classified library.

NATIONAL SECURITY RESEARCH CENTER

LOS ALAMOS NATIONAL LABORATORY

WHY DIDN'T OPPENHEIMER EVER WIN A NOBEL PRIZE?

By Brye Steeves, director, National Security Research Center

For his scientific achievement, he would be forever known as the father of the atomic bomb—but never as a Nobel laureate.

The pinnacle of global recognition, the Nobel Prize was awarded to 18 of J. Robert Oppenheimer's colleagues with whom he worked at the Manhattan Project site in Los Alamos. There, in just 27 months and in a perceived race with Nazi Germany, the scientists created the first nuclear weapons. Their efforts brought the world into the Atomic Age and helped end World War II. Several earned the prize before coming to work at the wartime lab, while most would go on to win later in life.

Oppenheimer was nominated for the Nobel Prize in Physics three times: in 1946, 1951, and 1967. Colleagues, scholars, and surely Oppenheimer himself pondered why he was never bestowed the honor.

"To understand this," said James Kunetka, historian and author of *The General and the Genius*, "you have to first examine the man's academic life before and after the war."

Though the creation of the first atomic weapons made Oppenheimer a household name, his celebrity did not translate into a Nobel Prize.

UNDISPUTED GENIUS

Born in 1904 into a wealthy Jewish family and raised in New York, Oppenheimer was obviously gifted. He completed the third and fourth grade in just one year and later skipped a portion of his eighth-grade year. Remarkable anecdotes of brilliance illustrate his life through early adulthood. As a boy, he was interested in mineralogy and, at age 12, presented his research paper to the New York Mineralogical Club and became an honorary member. As a young academic, he learned Dutch in six weeks to successfully deliver a technical lecture on a trip to the Netherlands. It was there he was first dubbed "Oppie" ("Opje" in Dutch).

"[He was] one of the sharpest people I have ever seen or heard of, intellectually," said longtime friend Harold Cherniss in a 1979 interview. "When he became interested in anything, he very quickly picked up an enormous amount of knowledge about it."

After graduating at the top of his high school class, Oppenheimer studied science at Harvard University, where he was admitted to graduate-level physics classes during his first year. He also took courses in languages, literature, philosophy, and religion, earning his degree in just three years, but with no social clubs or athletics listed under his name in the 1926 yearbook. Introverted, and perhaps lonely, Oppenheimer once told a friend, "It's no fun to turn the pages of a book and say, 'Yes, yes, of course, I know that,'" according to an October 1949 article in *Life* magazine.

After a stint at the University of Cambridge in the United Kingdom, Oppenheimer went to the University of Göttingen in Germany, where he studied quantum physics and earned his doctorate in 1927. By 1929, he accepted offers to teach at both the California Institute of Technology (Caltech) and the University of California, Berkeley.

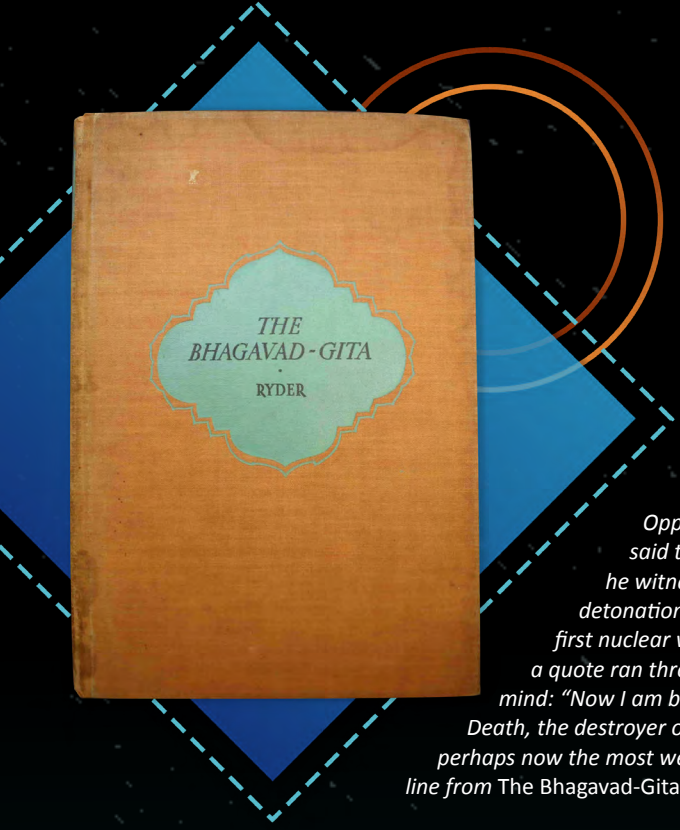
Oppenheimer's early research focused on energy processes of subatomic particles, including electrons, positrons, cosmic rays, neutron stars, and black holes. He was soon recognized as a leader in theoretical physics and had earned the respect of scientific greats such as Albert Einstein and Niels Bohr.

"However, many of his colleagues and critics point out that his production of significant papers was surprisingly thin," Kunetka said. "It was said by some that he far too often co-authored papers with his students rather than initiated them. [Nobel laureate and physicist] Hans Bethe noted that, while Oppenheimer and others were perhaps more brilliant, he [Bethe] was more productive."

Oppenheimer was an outstanding teacher, inspiring and influencing students. He earned a loyal following, if not outright adoration. "Like most of his students, I would more or less follow him to the ends of the earth," recalled Manhattan Project scientist Robert Christy in a 1983 interview.

LEADERSHIP

Oppenheimer lacked large-scale managerial experience prior to his directorship at Los Alamos, and his associations with members of the Communist Party, including friends, a former girlfriend, and his brother, were problematic. And without a



Oppenheimer said that as he witnessed the detonation of the first nuclear weapon, a quote ran through his mind: "Now I am become Death, the destroyer of worlds," perhaps now the most well-known line from The Bhagavad-Gita.

Nobel Prize, it wasn't certain whether Oppenheimer would have the prestige to lead the Los Alamos scientists.

But as soon as General Leslie Groves met Oppenheimer, none of that mattered, according to Oppenheimer biographer Ray Monk. The young professor impressed the Manhattan Project leader with both his intelligence and practicality. Oppenheimer would seemingly be able to turn blackboard theories and lab experiments into atomic weapons. Groves also may have seen a drive-based ambition, according to Monk, assuring him that Oppenheimer would, indeed, succeed.

In the fall of 1942, Groves hired the 38-year-old Oppenheimer to direct the wartime laboratory. Oppenheimer recommended Los Alamos as the site for the clandestine lab and recruited science's greatest minds to join him there. By then, Oppenheimer was described as charismatic and charming. He was the center of attention at parties, drinking his signature martinis and gesticulating with cigarettes through story after story. "Oppenheimer commanded not just the loyalty but the deep respect of everybody who was at Los Alamos, and I cannot think of anyone else who would have succeeded as he did in that sense," said Manhattan Project physicist and Nobel laureate Roy Glauber.

But Oppenheimer also was known as cruel and intolerant toward those he perceived as intellectually inferior, and was called a showman and a power seeker. Nevertheless, according to Alan Carr, senior historian at Los Alamos National Laboratory's National Security Research Center, Oppenheimer's worst enemies would concede that he achieved greatness during the war.

"He was very close to being indispensable," an unnamed Los Alamos scientist said, according to the 1949 *Life* article. Another said, "The main decisions were made by Oppenheimer, and all proved to be correct."

ATOMIC SUCCESS

Oppenheimer's directorship, perhaps along with his genius, culminated on July 16, 1945, when the world's first-ever atomic device was successfully detonated in the New Mexico desert. Oppenheimer, who read and wrote poetry, named the test "Trinity." He said years afterward that he may have been inspired by a John Donne poem that includes the line: "Batter my heart, three-person'd God." Weeks later and just days apart, the United States released the gun-type uranium bomb, Little Boy, and the implosion-style plutonium bomb, Fat Man, above Japan.

Groves phoned Oppenheimer after the first detonation. According to a transcript of the recorded call, Groves said, "I think one of the wisest things I ever did was when I selected [you] the director of Los Alamos."

To which Oppenheimer responded: "Well, I have my doubts, General Groves."

And Groves replied: "Well, you know I've never concurred with those doubts at any time."

AFTER WORLD WAR II

Oppenheimer once said "physics and desert country" were his "two great loves." In Los Alamos these came together, and it's where his work as a physicist changed the world.

He left Los Alamos a few weeks after World War II's official end on September 2, 1945. "Oppenheimer" was now a household name. With his face on magazine covers, star treatment followed. His celebrity, though, did not translate into a Nobel Prize.

He first returned to Caltech but soon left to lead the Institute for Advanced Study in Princeton, New Jersey, and serve as the chairman of the General Advisory Committee, a scientific panel that advised the newly formed Atomic Energy Commission. Much of his focus shifted from his pre-war physics work to policy work. Oppenheimer spoke out in opposition to the development of the even more powerful hydrogen bomb, questioning its feasibility and deeming it an unnecessary weapon. Meanwhile, he wrote and lectured but did not resume much research.

In 1954, he lost his security clearance following unsubstantiated accusations against his loyalty. Though his supporters remained steadfast and numerous, Oppenheimer eventually retreated from public life and work, pushing him further from a Nobel Prize than ever.

"SCIENCE IS NOT EVERYTHING," OPPENHEIMER ONCE SAID, "BUT SCIENCE IS VERY BEAUTIFUL."

WHY NO PRIZE?

Kunetka says the simplest explanation is that before World War II, Oppenheimer's published work was not considered significant enough. Carr agrees, adding that Oppenheimer never made a major discovery, nor did he ever prove a significant theory.

"The Nobel Prize requires more than just a remarkable idea," Carr said, "it requires evidence."

Of his Manhattan Project work, Oppenheimer himself said that creating the atomic bombs was inventive rather than scientific, according to the 1949 *Life* article.

When he was first nominated in 1946 for the Nobel Prize, the Nobel committee was hesitant to award it to someone so closely tied to the atomic bombs, according to *American Prometheus.* Many scholars and scientists through the years have concurred.

Others, though, have said Oppenheimer's scientific focus changed frequently and he didn't work sufficiently in any one area to warrant the Nobel Prize. Meanwhile, Monk thought Oppenheimer's work was more significant than credited, and some scientists, including Nobel laureate Luis Alvarez, speculated that Oppenheimer's work on black holes may have warranted the prize, had he lived long enough to see it brought to fruition. (Nobel Prizes are not awarded posthumously.) "In the end," Kunetka said, "we don't know."

Carr adds, "Did he achieve greatness? Yes, of course. What Oppie led his wartime team of scientists to achieve was nothing short of remarkable. He will always have that incredible scientific legacy."

LOYAL FOLLOWING UNTIL THE END

Oppenheimer died at his New Jersey home on February 18, 1967, after unsuccessful treatments for throat cancer. He was 62 and was survived by his wife, Kitty, and their two children. Kitty spread his ashes near their simple beach home in the U.S. Virgin Islands, following a memorial service at Princeton University. An estimated 600 people attended.

Charlotte Serber

The story of the Lab's first *female Group Leader*

By Brye Steeves, director, National Security Research Center

As our Lab was being created 80 years ago, J. Robert Oppenheimer handpicked Charlotte Serber for what he considered one of the most critical positions: overseeing the wartime technical library.

Her job wasn't easy.

Serber faced two significant obstacles: she did not have extensive formal training or experience as a librarian; and this library did not actually exist yet.

Regardless, in just two years' time, as Los Alamos scientists raced to secretly create the atomic bomb and help end history's deadliest war, Serber built and managed a classified technical reports library that Oppenheimer and his team relied on for scientific success.

Oppenheimer himself commended Serber back then, and Los Alamos commends her today. She was critical to the success of the Manhattan Project. Thanks to Serber, the original materials remain a part of the Lab's collections today, making up a vital component of the National Security Research Center (NSRC).

In honor of her contributions, NSRC staff and Lab leadership dedicated to her the room that houses the Classified Reports Collection, originally started by Serber. This room, now known as the Charlotte Serber Center, contains hundreds of thousands of classified materials, including documents, photos, handwritten notebooks, and the entire Rocky Flats Collection (actinide research and development data). These materials are used daily by researchers throughout LANL's Weapons Program and across the Nuclear Security Enterprise.

Who was Charlotte Serber?

Oppenheimer met Serber through her husband, Robert, his student, protégé, and friend. The Serbers even lived in a small apartment above the garage of the Oppenheimers' Berkeley,

Charlotte Serber (center, bottom row) *was handpicked by first Lab Director J. Robert Oppenheimer to oversee the wartime technical library. She built and curated collections that are still relied upon today.*

California, home before both couples moved to Los Alamos to help create the first atomic bombs.

Among Oppenheimer's first recruits, the Serbers arrived in Los Alamos in March 1943, according to *Their Day in the Sun: Women of the Manhattan Project.* While her husband focused on physics, Serber filled library shelves with reference materials that were first mailed circuitously around the country to avoid suspicion. She also oversaw the top-secret technical materials exchanged around the laboratory. In the beginning, there was just one safe, which only opened if Serber kicked it while dialing the combination, she wrote in *Standing By and Making Do.*

Meanwhile, Serber learned the Dewey Decimal System and how to catalog materials—all new concepts to the former freelance journalist. In his memoir, Robert Serber wrote that Oppenheimer saw Charlotte Serber's lack of library experience as a benefit because she would likely have fewer objections about cutting corners to hastily build a library.

As the library Group Leader, she oversaw an eventual staff of 12 and the thousands of materials that would come to fill the shelves, card catalogs, and storage cabinets.

High praise, crushing disappointment

By all accounts, Serber's library was exceptionally well run, which Oppenheimer noted in a post-war congratulatory letter he wrote to her, stating, "[No] single hour of delay has been attributed by any man in the laboratory to a malfunctioning, either in the library or in the classified files. To this must be added the fact of the surprising success in controlling and accounting for the mass of classified information, where a single serious slip might not only have caused us the profoundest embarrassment but might have jeopardized the successful completion of our job."

Although she had earned his praise, her work did not result in equal treatment relative to her male counterparts at the lab. Serber was the only Group Leader not invited to witness the first-ever detonation of an atomic bomb—the Trinity test—in the New Mexico desert on July 16, 1945. Oppenheimer said she was excluded because there were no sanitary facilities at the site. She was justifiably offended.

After the war and today

With the war's end, the Serbers returned to Berkeley. Charlotte sought a librarian position at the Berkeley Radiation Laboratory but was denied a security clearance related to accusations of involvement with communism. Following World War II, the loyalties of many, including Oppenheimer himself, were questioned without merit, and they suffered consequences.

Archivist John Moore works in the Charlotte Serber Center, which includes the Classified Reports Collection that Serber started in the early 1940s.

What is the Charlotte Serber Center?

The Charlotte Serber Center is part of the National Security Research Center, which is the Lab's classified library. It is named in honor of the Lab's only female wartime Group Leader.

The Center includes the Classified Reports Collection that Serber cultivated while Los Alamos scientists simultaneously accessed the materials to build the atomic bombs. The Center also includes the Rocky Flats Collection, the Directors' Correspondence Collection, a third of the NSRC's photos and negatives, and more. Additionally, it houses the NSRC's customer service area.

Collections in the Charlotte Serber Center help support today's national security mission work.

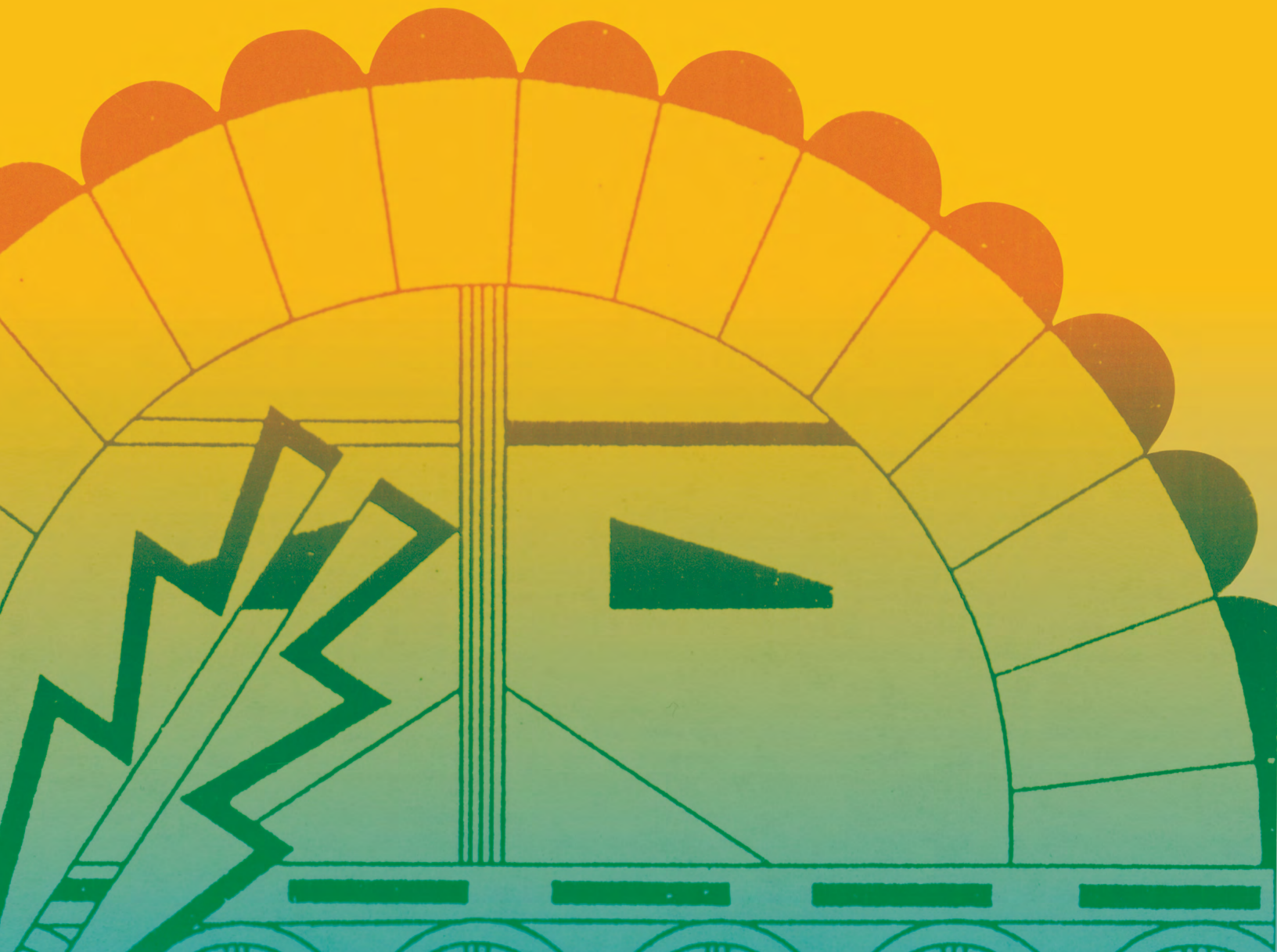
By the early 1950s, the Serbers moved to New York City, where Robert worked as a professor at Columbia University and Charlotte became a production assistant for the Broadway Theatre.

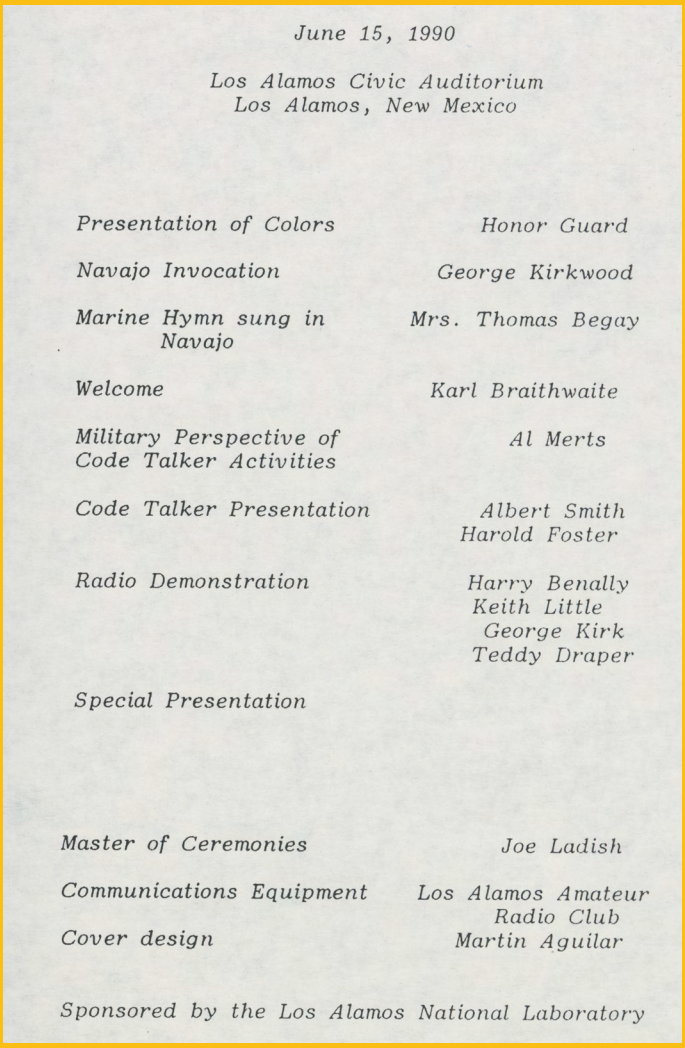
Charlotte Serber died May 22, 1967. Today, the NSRC remains part of her legacy, and she a more visible part of ours, through the Charlotte Serber Center.

Remembering World War II's

Navajo Code Talkers

By John Moore, archivist-historian, National Security Research Center





June 15, 1990

Los Alamos Civic Auditorium
Los Alamos, New Mexico

Presentation of Colors	Honor Guard
Navajo Invocation	George Kirkwood
Marine Hymn sung in Navajo	Mrs. Thomas Begay
Welcome	Karl Braithwaite
Military Perspective of Code Talker Activities	Al Merts
Code Talker Presentation	Albert Smith Harold Foster
Radio Demonstration	Harry Benally Keith Little George Kirk Teddy Draper
Special Presentation	
Master of Ceremonies	Joe Ladish
Communications Equipment	Los Alamos Amateur Radio Club
Cover design	Martin Aguilar

Sponsored by the Los Alamos National Laboratory

Program from a June 15, 1990, U.S. Marine Corps Navajo Code Talkers of World War II event sponsored by Los Alamos National Laboratory.

Last November, the National Security Research Center at Los Alamos National Laboratory honored Native American Heritage Month with a look back at the incredible history of the Navajo Code Talkers—a group of Native American Marines who used simple words and phrases from their unique tribal language to baffle Japanese code breakers and spur Allied victory in World War II's Pacific theater.

Many of Los Alamos' wartime employees came from surrounding pueblos. Native Americans were hired as technicians, researchers, machinists, and more, making valuable contributions to the Manhattan Project. While the Navajo Code Talkers did not originate from Project Y, many have direct connections to the modern Laboratory and are relatives of today's staff, including Darren Harvey, whose father was a cousin of Navajo Code Talker John Goodluck.

"Many Diné [Navajo] men enlisted as they felt a strong sense of service, to be a warrior and to protect their homelands and culture," said Harvey, who today is co-chair of the Laboratory's American Indian Employee Resource Group. "Unfortunately, these men came from backgrounds [schools] in which they were stripped of their language and culture, punished if they spoke Navajo. However, they developed an unbreakable code that will forever be remembered and honored, these men are cherished and are our heroes."

Following the passing of Navajo Code Talker Samuel Sandoval in July 2022, only three of the hundreds of original Code Talkers are still living. Sandoval died at 98 years old in Shiprock, New Mexico, and is the uncle of retired Laboratory staff member Jeannie Sandoval. Her father, Merril, was also a Navajo Code Talker. He died in 2008.

Native Americans and World War II

The idea of using Native American languages that could not be deciphered by enemy forces dates back to World War I, when members of the Cherokee and Choctaw Nations transmitted messages using their native languages on the battlefield. They were only speaking in their native languages, not in a code. It wasn't until World War II that a formal code using the Navajo language would be formed and successfully transmitted in combat.

Rooted in the Four Corners area (Arizona, Colorado, New Mexico, and Utah), the Navajo and their ancestors lived in the southwest hundreds of years before the arrival of European settlers to the Americas. Before the United States' entrance into World War II, many of the Navajo had never left their reservations. However, this would change after Japan's surprise attack on Pearl Harbor in December 1941.

Creating a code

Philip Johnston is credited with conceiving the idea of creating a code based on the Navajo language for the war effort. Johnston grew up primarily in Arizona on the Navajo Nation

Pictured standing side-by-side with their father and siblings, Merril and Samuel Sandoval were both Navajo Code Talkers during World War II. (Source: www.navajo-codetalker.com)

with his parents, who were missionaries, according to *The Navajo Code Talkers* by Doris A. Paul. There, he learned the Navajo language while playing with Navajo children.

As an adult, Johnston worked as a translator of the Navajo language. With the United States at war, using the language to develop a code occurred to him while reading a newspaper article about a military attempt to develop a code using some of their Native American recruits.

Shortly thereafter, Johnston contacted the military with his idea: "My plan is not to use translations of an Indian language, but to build up a code of Indian words. Let's imagine this code included terms such as 'fast shooter' to designate a machine gun, and 'iron rain' for a barrage. Navajo personnel would be thoroughly drilled to understand and use these substitutions."

This idea would form the basis for the legendary Navajo Code Talkers.

The first group of Navajo Code Talkers was made up of 29 individuals who ran radios and developed the code itself, according to *The Routledge Handbook of the History of Race and the American Military.* Initially, they established 211 keywords, taking common military English words like "tank" or "dive bomber" and translating them into Navajo. However, many such words did not have a clear counterpart in the Navajo language.

To solve this, the Navajo Marines translated the English words into animals or objects. For example, "submarine" was translated into iron fish, which is Besh-Lo. For words that could not be translated, the Marines would spell out the word using a phonetic system of representative words for each letter that could be translated back and forth from English to Navajo (see table for some examples).

At the June 15, 1990, event in Los Alamos, Navajo Code Talker veterans demonstrate how the Navajo code was used on the battlefields of the Pacific.

LETTER	ENGLISH	NAVAJO CODE WORD
A	Ant	Wol-La-Chee
B	Bear	Shush
C	Cow	Ba-Goshi
D	Deer	Be
E	Eye	Ah-Nah
F	Fly	Tsa-E-Donin-Ee
G	Goat	Klizzie
H	Hat	Cha

(Source: https://www.vctm.org/The-Navajo-Code-Talkers-of-World-War-II)

Unbreakable communications

The code proved highly successful—the Japanese military was never able to break it.

In combat, the Navajo Code Talkers would work in groups of two. To send a message, one Navajo Marine would translate the message and the second would send it over the radio. When receiving a message, the radioman would receive the code in Navajo and the second man would translate it back into English.

The Navajo code was used throughout the Pacific theater in World War II from Guadalcanal in the Solomon Islands to Okinawa, Japan.

During the Battle of Iwo Jima in February 1945, Marine Maj. Howard M. Connor said, "The entire operation was directed by Navajo Code. Our corps command post was on a battleship from which orders went to the three division command posts on the beachhead, and on down to the lower echelons. I was [a] signal officer of the Fifth Division. During the first 48 hours, while we were landing and consolidating our shore positions, I had six Navajo radio nets operating around the clock. In that period alone they sent and received over 800 messages without error" *(The Routledge Handbook of the History of Race and the American Military)*.

By the end of the war in August 1945, 600 to 800 codewords had been developed by the Navajo Code Talkers for transferring messages in combat.

A Navajo Code Talker veteran explains how the alphabet was used to form a code during World War II.

Oppenheimer biographer

TOURS LAB

Hollywood movie filmed *locally;* NSRC produces *documentary*

By National Security Research Center staff

While a Hollywood crew filmed the *Oppenheimer* movie in Los Alamos in the spring of 2022, a special guest stopped by the Lab in between takes and chats with big-name actors.

Kai Bird toured the Lab while he was in town to meet the cast and crew filming the Oppenheimer *movie, which is based on Bird's book. Bird is shown here with a recently donated Manhattan Project–era truck.*

LANL Director Thom Mason invited Kai Bird, co-author of *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer,* to visit the Lab while Bird was in town. Bird's Pulitzer Prize–winning biography, published in 2005, forms the basis of *Oppenheimer*, written and directed by Christopher Nolan. Oppenheimer was a physicist and the Lab's first director during its wartime mission to develop the atomic bombs that would help end World War II.

"It was a privilege to meet Kai," Mason said. "His knowledge of Los Alamos history and Oppenheimer is unsurpassed and I enjoyed talking with him about our Lab's earliest years and the diverse work we do today."

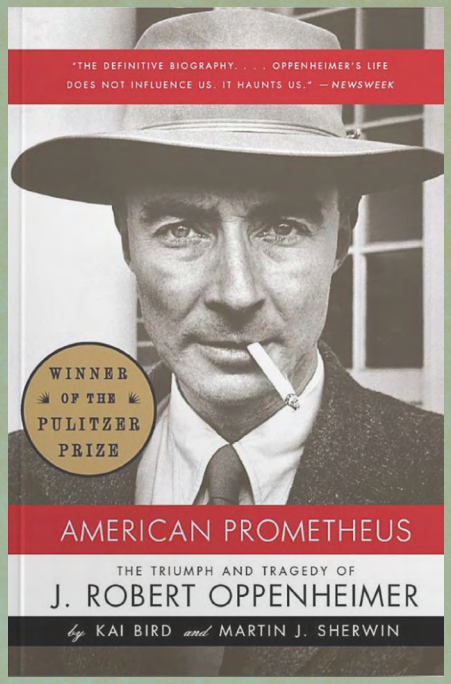
Bird and his wife, Susan Goldmark, were given an unclassified tour of the Lab's National Security Research Center (NSRC), which houses classified and unclassified World War II materials. They were also shown various sites around the Lab and in town that were significant during the Manhattan Project, the U.S. government's top-secret effort to create the first atomic weapons.

Touring Oppie's library

The NSRC traces its origins to the technical library that Oppenheimer started in 1943 as part of the Lab's inception, and curates those collections today. NSRC staff showed Bird and Goldmark unclassified legacy items, such as Oppenheimer's handwritten notes, badge photos from the Lab's wartime staff, physicist Enrico Fermi's observations from the Trinity test, and Oppenheimer's office chair.

One item that Bird said he had not previously been aware of was a 1954 petition (see page 48). It was signed by hundreds of Los Alamos staff in protest of Oppenheimer's security clearance being revoked following unsubstantiated allegations of disloyalty, among other issues.

The Lab's senior historian Alan Carr said, "From one student of history to another, it was wonderful to meet Kai and share with him the truly fascinating artifacts from a time—and a man—that we've both dedicated a significant amount of our professional lives to."



American Prometheus, *published in 2005 and written by Kai Bird and Martin J. Sherwin. Cover photograph by Alfred Eisenstaedt / Pix Inc. / Time & Life Pictures / Getty Images. Cover design by Stephanie Kloss.*

Seeing where it all began

Bird and Goldmark's tour included Bathtub Row, the only wartime homes with bathtubs, which were reserved for lab leadership; the V-Site, where the Trinity device's high-explosive components were prepared; and the Gun Site, where the Little Boy weapon was developed.

The two were led from site to site, swapping historical anecdotes along the way, by Jonathan Creel, Manhattan Project National Historical Park's public engagement specialist; Elliot Schultz, historian of science; and Cheryl Abeyta, Manhattan Project National Historical Park program manager.

"It was fascinating to hear Kai reminisce about his work on the book as we showed him around," Creel said. "I enjoyed his enthusiasm for these historic places that our team works with every day, plus it was exciting to hear him relate these sites to his own work."

Face to face

Bird has visited Los Alamos two previous times; on this occasion his visit was at the invitation of *Oppenheimer* director Christopher Nolan, to see Bird's book brought to life.

Bird said, "We were allowed to watch about three hours of filming on the set. . . . During a break in the filming I was introduced to Cillian Murphy, the Irish actor playing Oppie, and I greeted him, 'Dr. Oppenheimer, I have been waiting decades to meet you!' Murphy laughed."

Oppie's legacy and LANL

Meanwhile, the NSRC created the documentary *Oppenheimer: Science, Mission, Legacy.*

The three-part film tells the story of Oppenheimer using notes, photos, and films from the NSRC's collections and through interviews with the Laboratory's past and present leadership, as well as historians, physicists, and biographers. In addition to Bird and Mason, interviewees include current and former Lab staff; Jim Kunetka, author of *The General and the Genius*; and recently retired U.S. Senate staffer Tim Rieser, who was instrumental in the recent vacating of Oppenheimer's security clearance revocation. *Oppenheimer: Science, Mission, Legacy* can be viewed at nsrc.lanl.gov.

"The Lab is in a unique position to tell this story, thanks to our historic collections, which actually began as Oppenheimer's wartime technical library during the Manhattan Project," said Brye Steeves, director of the NSRC. "Oppenheimer's legacy is part of our legacy today. The work that he began underlies our contributions today to our nation's security."

Kai Bird, co-author of a biography on the Lab's first Director J. Robert Oppenheimer, visited Los Alamos and Lab sites with his wife Susan Goldmark. Bird's book is the basis for a Hollywood film on Oppenheimer by Christopher Nolan; Bird is also included in an Oppenheimer documentary created by the Lab's National Security Research Center.

LOS ALAMOS AND THE BRITISH MISSION

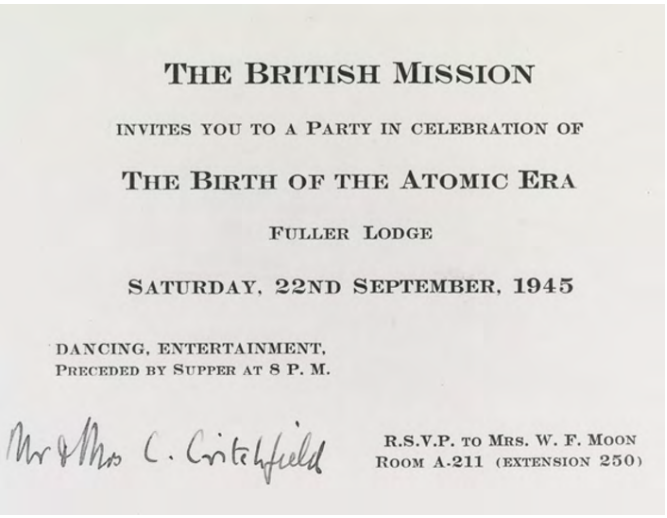
A partnership between countries that endures today

By Angie Piccolo, archivist,
National Security Research Center

After 27 months of grueling hours and scientific secrecy amidst the pressure of a mounting death toll and Nazi Germany's own weapons development, the race to create an atomic bomb had come to an end. It was time to celebrate.

On September 22, 1945, scientists, engineers, and their families gathered downtown at Fuller Lodge to celebrate the success of the Los Alamos atomic bombs and the end of World War II.

The party was hosted by members of the British Mission and their wives and included food, dancing, and a satirical play based on the lighter moments of wartime life in Los Alamos. However, this party was more than just entertainment and a night of festivities; it also represented a partnership between countries that endures today.



THE BRITISH MISSION

INVITES YOU TO A PARTY IN CELEBRATION OF

THE BIRTH OF THE ATOMIC ERA

FULLER LODGE

SATURDAY, 22ND SEPTEMBER, 1945

DANCING, ENTERTAINMENT,
PRECEDED BY SUPPER AT 8 P. M.

Mr & Mrs C. Critchfield

R.S.V.P. TO MRS. W. F. MOON
ROOM A-211 (EXTENSION 250)

This invitation to a "Birth of the Atomic Era" party hosted by members of the British Mission and their families is part of the collections of the Lab's National Security Research Center.

What was the British Mission?

The British Mission was made up of some of Europe's best experimental and theoretical physicists as well as experts in electronics and explosives. They worked alongside American scientists during the U.S. government's top-secret Manhattan Project to create an atomic bomb in a perceived race against Nazi Germany. This group of scientists included Nobel laureates James Chadwick and Niels Bohr; future Nobel laureate Joseph Rotblat; and Klaus Fuchs, later confirmed to be a spy who provided Russia with secret nuclear information.

Were they all from Great Britain?

Fifteen members of the British Mission were British nationals, including William Penney, Ernest Titterton, and James Tuck. NSRC senior historian Alan Carr explains in his article "Remembering the British Mission" that some ". . . members of the British Mission fled to Britain to escape the persecution of Jews and the Nazi regime." These refugees included Niels Bohr and his son Aage from Denmark; Boris Davison from Russia; Otto Frisch from Austria; Klaus Fuchs and Rudolf Peierls from Germany; and Joseph Rotblat from Poland.

Historic U.S.-U.K. Partnership

The science of atomic weapons began with the discovery of nuclear fission in Europe in 1939. British research related to the development of a nuclear bomb accelerated in 1940 after scientists Rudolf Peierls and Otto Frisch wrote a memorandum indicating the need for only a small amount of uranium to produce a weapon, according to Dennis C. Fakley in "The British Mission."

Fakley's article also explains that the memorandum was sent to Britain's newly established MAUD Committee,

which developed its own reports confirming the feasibility of an atomic bomb. These reports were shared with the United States, which at first was not as committed to nuclear research as the United Kingdom.

This changed with Japan's attack on Pearl Harbor in December of 1941 and the United States' entrance into World War II. The U.S. began its own separate research and was less willing to share information with the U.K. because of concerns over what the British would do commercially after the war, according to the NSRC documentary *Trinity and the British Mission*.

The documentary explains how the U.S. quickly surpassed the U.K. in research given its vast resources and the geographic advantage of being far from the battlefields. U.K. Prime Minister Winston Churchill and U.S. President Franklin D. Roosevelt signed the Quebec Agreement in 1943, which cemented Britain's collaborative, albeit secondary, role in the research and development of atomic weapons with the United States. Members of the British Mission began arriving in the United States soon after.

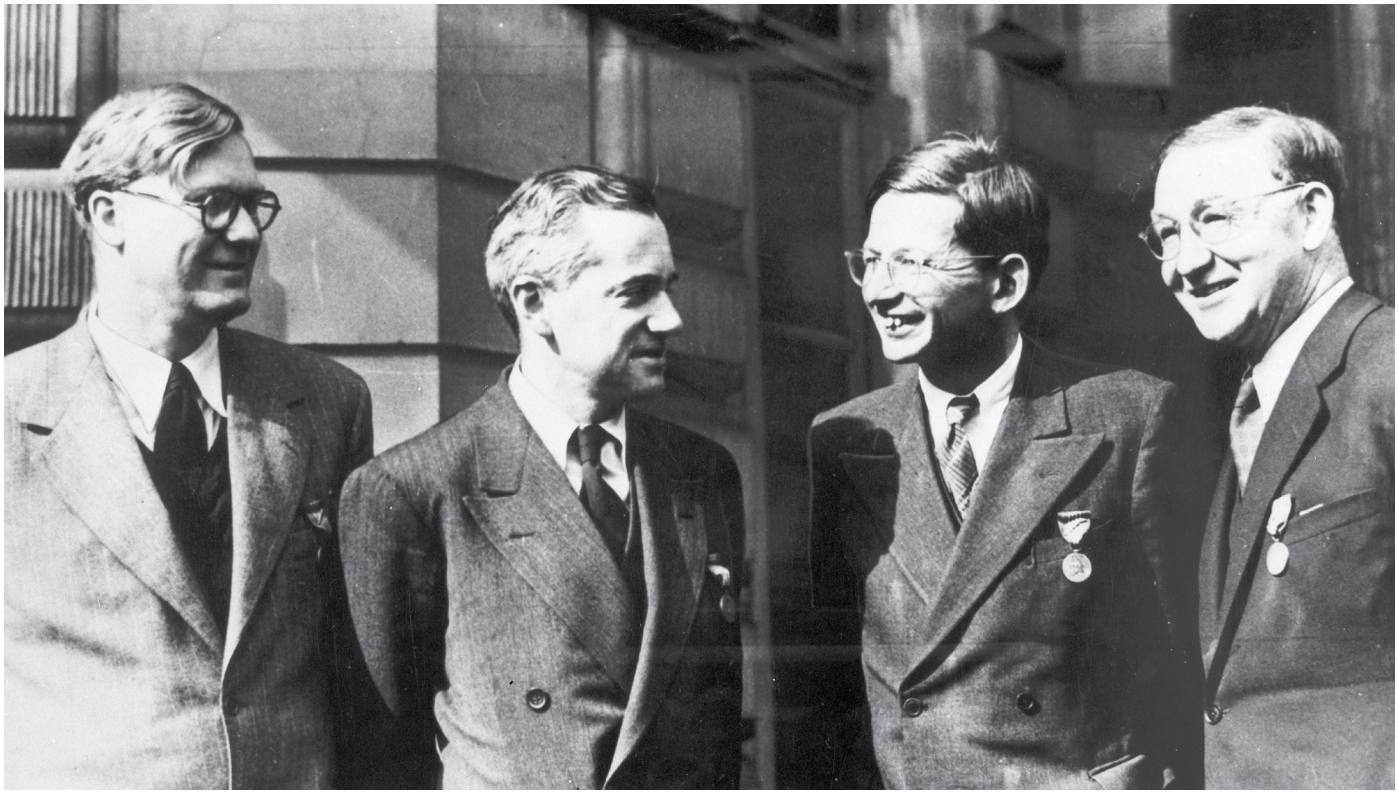
What did the British Mission contribute to the Manhattan Project?

The British Mission made up a very small portion (only 19 individuals) of the scientific community at Los Alamos, but "their small numbers belie their importance to the mission of the wartime lab," said NSRC historian Nic Lewis.

According to Lewis, members of the British Mission "brought their expertise in several key areas, including explosives and hydrodynamics. James Tuck, for example, helped to develop the shaped explosive lenses for the implosion weapon and Rudolf Peierls used his experience with airborne blast waves to contribute to numerical solutions to hydrodynamic problems."

Meanwhile, William Penney, the post-World War II leader of the British nuclear weapons program, "calculated the height at which the atomic bombs should be dropped over Japan, and worked with [Los Alamos scientist and future Nobel laureate] Luis Alvarez to predict the damage effects of the blast waves."

Author Ferenc Szasz writes in *British Scientists and the Manhattan Project* that other members of the British Mission took on important positions at Los Alamos by leading various groups. This included Otto Frisch leading the Critical Assemblies group, Egon Bretscher leading the Super Experiments group, and George Placzeck taking charge of the Composite Weapons group. Although James Chadwick remained in Washington, DC, during the war, he contributed to the success of the Manhattan Project through his diplomatic efforts toward developing a strong bond with U.S. Army General Leslie Groves, head of the Manhattan Project, and maintaining good relations between the two nations.



William Penney, Otto Frisch, Rudolph Peierls, and John Cockcroft were four members of the British Mission that worked alongside American scientists and engineers on the Manhattan Project during World War II.

After World War II, the Atomic Energy Commission, a civilian-controlled federal agency and precursor to the Department of Energy, took over operations at Los Alamos.

Classified information regarding nuclear weapons research and development was no longer shared with foreign countries, including Britain. As such, British Mission scientists were no longer even allowed access to their own reports.

Everett Titterton was the last of the British Mission members to leave the Lab, on April 12, 1947, and it wasn't until the signing of the Mutual Defense Agreement in 1958 that the U.S. and the U.K. began sharing information again, according to Carr's "Remembering the British Mission."

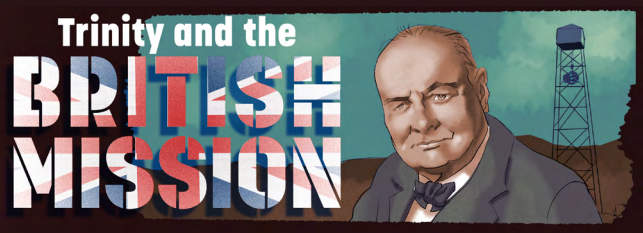
The British Mission Reports Collection

The National Security Research Center (NSRC) houses the British Mission Reports Collection, which includes documents, memos, and research created by members of the British Mission; the collection highlights their experimental findings, investigations, and developments in nuclear science during the Manhattan Project.

According to NSRC archivist Danny Alcazar, this unclassified collection is significant because it covers British research not only during World War II but also before U.S. entry into the war and demonstrates how British scientists' discoveries contributed to the Manhattan Project and the creation of the atomic bomb.

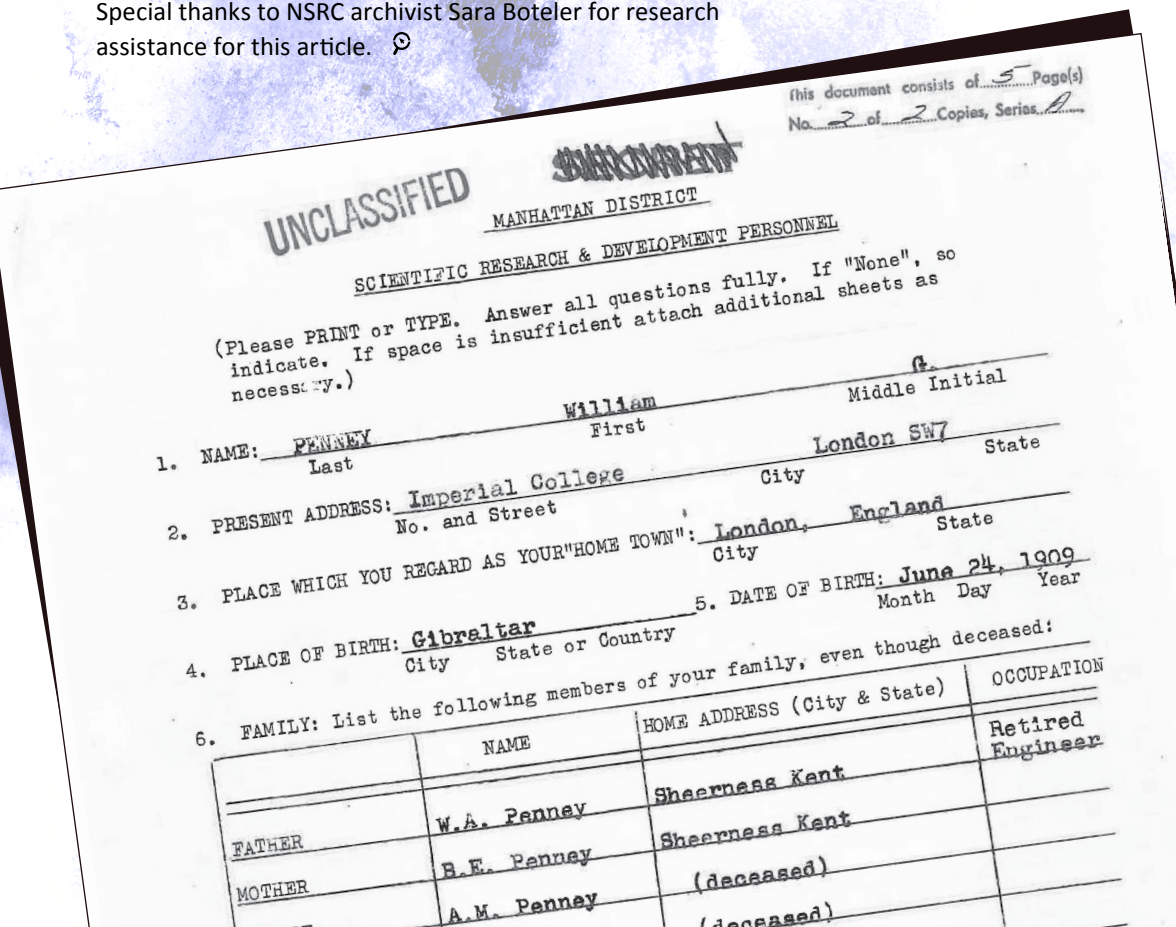
Special thanks to NSRC archivist Sara Boteler for research assistance for this article.

WATCH THE NSRC DOCUMENTARY



Packed with archival footage, this NSRC-produced documentary illuminates the complex collaboration between scientists of the Manhattan Project and the British Mission. The film also traces the evolution of the partnership between the two countries from the end of the war to the present day.

Trinity and the British Mission is narrated by the NSRC's senior historian Alan Carr and features interviews with senior scientists at Los Alamos, including Mark Chadwick, Marianne Francois, and U.K. Atomic Weapons Establishment historian Richard Moore.



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MANHATTAN DISTRICT

SCIENTIFIC RESEARCH & DEVELOPMENT PERSONNEL

(Please PRINT or TYPE. Answer all questions fully. If "None", so indicate. If space is insufficient attach additional sheets as necessary.)

1. NAME: PENNEY (Last) William (First) G. (Middle Initial)
2. PRESENT ADDRESS: Imperial College (No. and Street) London SW7 (City) (State)
3. PLACE WHICH YOU REGARD AS YOUR "HOME TOWN": London, England (City) (State)
4. PLACE OF BIRTH: Gibraltar (City) (State or Country) 5. DATE OF BIRTH: June 24, 1909 (Month Day Year)
6. FAMILY: List the following members of your family, even though deceased:

	NAME	HOME ADDRESS (City & State)	OCCUPATION
FATHER	W.A. Penney	Sheerness Kent	Retired Engineer
MOTHER	B.E. Penney	Sheerness Kent	
	A.M. Penney	(deceased)	
		(deceased)	

The Manhattan District requested that leading scientists and engineers from the Manhattan Project fill out questionnaires. These records now provide important details about the contributions made by members of the British Mission during the Manhattan Project.

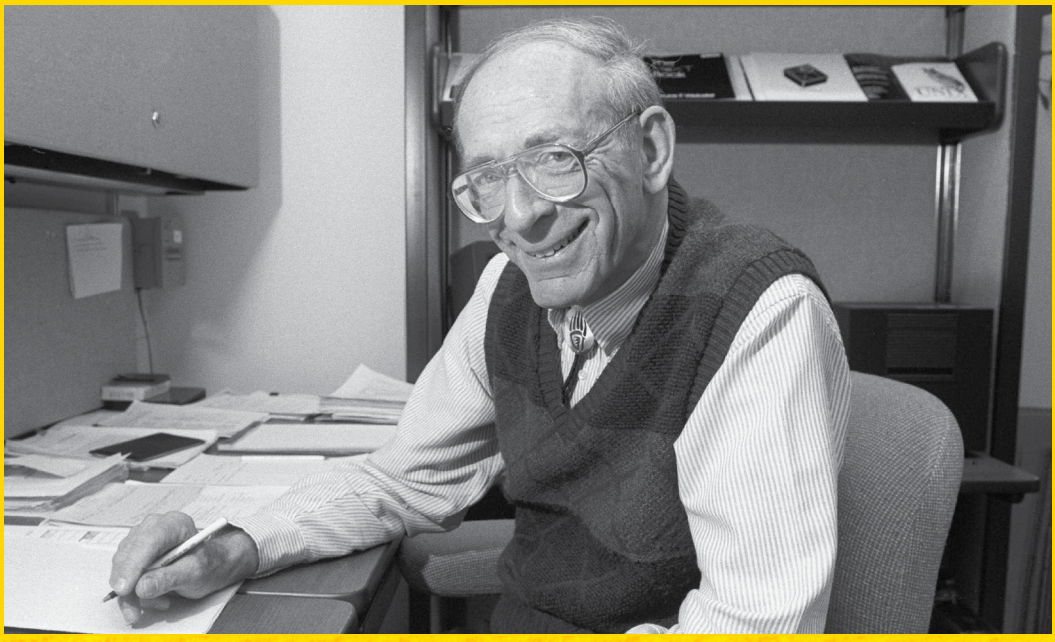
LOS ALAMOS NATIONAL LABORATORY

nsrc.lanl.gov

The scientific achievements from the Lab's earliest days were not only remarkable, they also form our legacy. We began as a secret laboratory, under the leadership of Manhattan Project leader General Leslie Groves and first Lab Director and physicist J. Robert Oppenheimer. Our charge: to develop the first-ever atomic weapons to help end World War II. This goal required extraordinary innovation driven by scientific discovery and creative engineering. In the eight decades that have followed, our national security mission has continued. Our innovative science began in 1943 and will endure into the future.

NATIONAL SECURITY RESEARCH CENTER

LOS ALAMOS NATIONAL LABORATORY



Remembering

J. Arthur Freed

By Cristina Olds, communications specialist, for the National Security Research Center

J. Arthur "Art" Freed embodied his awarded title as a "Living Treasure" for the Los Alamos community, and before that for Los Alamos National Laboratory. Born in San Francisco to Hungarian immigrants, he found his calling as a librarian at Los Alamos Scientific Laboratory, as the Lab was called when he was hired in 1958.

Art Freed saw an advertisement like these that used images and vignettes about the unique New Mexico environment to recruit workers during the late 1950s and early 1960s.

Freed was working as a librarian at the Brooklyn Public Library in New York, when he spied an advertisement touting the unique benefits of employment at Los Alamos. Views of sunsets and mountains, walks through the woods to get to your office, and "unequaled laboratory facilities where 'tomorrow's' ideas are born and developed." Freed was intrigued.

"'Where's that?' I probably said," Freed recalled in a recorded interview with senior Laboratory historian Alan Carr. His wife, Nancy, was working in a materials testing lab for the U.S. Navy at the time, and her skills translated to a staff position at LASL as well.

They soon left for the Southwest, where Freed worked for 33 years in the Lab's library, serving as a Group Leader and head librarian from 1970 until the year before he retired in 1991.

Having first completed a bachelor of arts in anthropology at the University of California, Berkeley, Freed later earned

master's degrees in anthropology and library science. Between his degrees, Freed served in the U.S. Army from 1952 to 1954.

Freed said his father didn't care what he studied, only that he could support himself. He was working in a library and completing his first master's degree when his supervisor suggested he pursue library science.

Of his alma mater, Freed said, "The most important part was I met my wife there." Freed called Nancy the love of his life and credited their nearly 41 years of marriage as the reason he lived so long. "The university president said at the time that the Berkeley campus was the largest marriage bureau in the world," Freed laughed, adding, "and that was the case for us." The couple met through mutual friends and were married in 1954.

Freed died in Los Alamos on June 21, 2022, at age 92. He had lost Nancy in 1994 to cancer. The couple didn't leave any immediate survivors.

The value of a librarian's work to national security

Art Freed joined the Lab 13 years after World War II ended in 1945. Freed served under Lab Directors Norris Bradbury and Harold Agnew and no doubt interacted with other notable figures from the Manhattan Project, the top secret effort to create the world's first atomic bombs to help end the war that made Los Alamos a household name.

The role of the library, with its many classified and unclassified resources, wasn't always explicitly valued during the decades after the war, but Freed clearly felt the responsibility of his position in the context of national security.

"Art recognized the unique and priceless asset we had in the library going back through the Manhattan Project era," Carr said. Many reports that Freed once maintained live on in the Lab's National Security Research Center (NSRC) and remain accessible to staff scientists born decades after they were collected and archived.

"Making this information accessible is a cornerstone of good science and is a cornerstone of Art's legacy," Carr added. "There is tremendous utility in keeping our old reports; we have useful data that cannot be easily duplicated, if it can be duplicated at all."

Now, with tens of millions of materials, the NSRC is one of the largest libraries in the United States. It houses the country's most comprehensive collection of nuclear weapons–related national security documents, films, photos, and more.

Art Freed with other Lab librarians in 1978. Courtesy photo.

Nancy and Art Freed in White Rock, New Mexico. Courtesy photo.

"At the NRSC, we maintain many things Art collected and managed, and we strive to carry on that legacy," Carr said. "We have an incredible documentary foundation because of people like Art."

A day in the life of a Lab librarian

The Lab library collection comprised printed books, journals, and nearly a half million formal technical reports in Freed's day. According to Marie Harper, a library professional hired by Freed in 1989, the library "owned the nation's crown jewels," referring to the Weapons Physics and Engineering classified collection.

Art Freed and friends with the monkey mascot that traveled with him in his younger years. Courtesy photo.

Art Freed was presented with a plaque commemorating his 49 years of service on the Oppenheimer Committee as chair, vice chair, secretary, and archivist. Courtesy photo.

Harper, who retired in 2018, had previously worked for other scientific institutions and said she saw publications at the Lab library that she'd only read about.

"Art was essential for building the collection of sometimes very expensive but fundamental publications—I replaced a copy once that cost $3,500," she said. "We had the only copy in the state of some books. Nobody argued with Art about having those tools—we had them because people needed them."

Some of the materials Freed amassed for the library were challenged, however, like a multi-volume set of the Oxford English Dictionary. "The 'cut-and-dried' engineers said, 'what do we need that for?' Art insisted [that staff needed it] and he justified the cost," Harper said. "I looked up the price from 1975 and it was more than $10,000."

Notably, and likely a career highlight, Freed helped oversee development of the Lab's modern conference and library facility, the Oppenheimer Study Center, completed in 1977. Then Laboratory Director Harold Agnew conceived the Study Center idea while working as a scientific adviser at NATO. Agnew saw conference facilities with study areas and access to library facilities unlike those in the U.S. Once he returned to Los Alamos, he obtained financial backing for the concept.

Harper was tasked with retrofitting the library to accommodate computers during the early '90s, and she called Freed frequently in his retirement to consult with him about the building's details.

A day in the life of a retired librarian

Besides the expansive New Mexico landscape and the cutting-edge science in Los Alamos, Freed found a community. He participated in several Los Alamos organizations in alignment with his dedication to the science of the Laboratory and his longstanding commitment to preserving history during retirement.

In 2021 the J. Robert Oppenheimer Memorial Committee bestowed Freed with the title of emeritus member.

Fellow committee member David Izraelevitz said Freed's meticulous work on the committee was dedicated to maintaining Los Alamos legacies. "Art was very enamored with retaining knowledge and believed you don't know something if you can't preserve it for others to learn from as well," Izraelevitz said, "which is consistent with his career as a librarian."

Freed acquired photos of the Oppenheimer family directly from Kitty Oppenheimer that have been exhibited in Los Alamos on two occasions.

"Oppenheimer has a certain mystery around him and the family also, and you get a pretty good idea of who he was [from the photos]," Freed said. He guarded those photos in boxes in his basement for years. In 1982, the photos were the first collection formally accessioned into the Laboratory collections; today the NSRC continues to maintain the images on behalf of the committee.

Additionally, he helped the committee obtain a bronze bust of Oppenheimer by the notable sculptor Una Hanbury that is on display in the Los Alamos History Museum today.

In 2016, Freed received the Los Alamos Historical Society's Los Alamos History Medal, and in 2020, he was honored with the Los Alamos History Award, which recognizes those who have made a significant contribution to preserving the world-changing history of the community.

"Lucky communities have an essential someone who makes things work yet is content to remain in the background. Known for his sound judgment, competence, selflessness, and humor, 2017 Living Treasure J. Arthur Freed is a Los Alamos Essential Someone," wrote Colleen Olinger in the *Los Alamos Daily Post* in April of that year.

He traveled extensively throughout his life, often following performances of the John Adams opera *Doctor Atomic*. In his younger years, Freed packed a wooden monkey that he and Nancy had found together on their travels, as a sort of good luck charm.

Freed socialized frequently and kept in touch with former schoolmates and colleagues. For many years, he would host a "holiday sherry" party at his home. "He had so many friends they all couldn't come at once so Art rotated so that every third year you got invited," Carr remembers. "You would park at Mesa Public Library and catch a bus to his house that he'd set up. It was a staple community event where you could mingle with a diverse community and over the years it became like homecoming to see all those people again."

Resilience during tough times

Although Freed was respected and valued, his time at the Lab was not free of controversy. In the 1970s, the Lab's unclassified and classified technical reports were stored together. As a result of human error, classified material was mistakenly left in the open, unclassified area of the library. The mishap was reported in the national news, and several political cartoonists capitalized on the government error.

Then Lab Director Don Kerr called Freed into his office, surely to be fired, Freed thought. But his last day at the Lab was long away. Freed wrote to all the cartoonists asking for their original artwork.

"He faced this setback with grace and dignity," said Carr, adding that Freed hung the framed cartoons in his home.

If he could see us now

"We really do have unique resources at the NSRC, and Art made it possible as a librarian and as a manager of librarians," Carr said. "We wouldn't have all this without Art and others like him who created a remarkable foundation, and enabled the current NSRC team to take it to the next level."

When Freed turned 80, his many friends held a surprise party for him at the Blue Window Bistro in Los Alamos. His friend and former colleague Jeannette Mortensen gathered historic photographs and postcards from his travels, along with cards and letters sent for the occasion, in a memory book.

She displayed the book at Freed's celebration of life event the friends held in August 2022.

Mortensen also penned a parody of "(You Gotta Have) Heart," from the 1955 musical comedy *Damn Yankees,* titled "You Gotta Have Art." Former head of the Los Alamos Historical Society Hedy Dunn contributed to the lyrics.

Freed's community sang from their hearts at his memorial service: "When your staff is down to zero, and you need a volunteer, Mr. Freed can be a hero, he can be a perfect dear. There's nothin' to it: he will do it! . . . Yes we all love our Art . . ."

A friend shared this group shot of Art Freed (front left) *and Lab colleagues for a memory book created by Jeannette Mortensen. Courtesy photo.*

Lab groups partner to CHANGE STREET SIGN

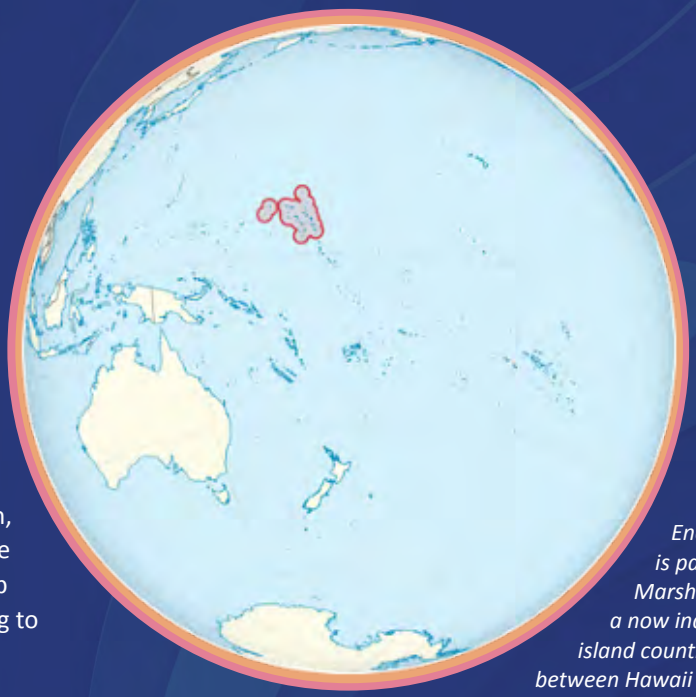
NEW SPELLING HONORS CULTURE, REVISITS WEAPONS LEGACY

By Brye Steeves, director, National Security Research Center

It's more than just a street name. "Enewetak Drive" represents a piece of Lab history and recognizes a culture.

For many decades this road on campus has been spelled "Eniwetok Drive." This past year, the Lab officially changed the street signs to Enewetak Drive. This is the preferred spelling of those indigenous to the Pacific atoll where the Lab had a significant presence during the nation's weapons testing period.

As part of the Lab's recognition of Asian American, Native Hawaiian, and Pacific Islander Heritage Month, the National Security Research Center (NSRC) and the Asian Pacific Islander (API) Employee Resource Group (ERG) together unveiled the new sign after partnering to correct the spelling.



Enewetak Atoll is part of the Marshall Islands, a now independent island country in the Pacific between Hawaii and Australia.

"Changing the spelling shows how much support the Lab's ERGs receive from the highest levels of leadership and that our Lab values diversity and inclusivity," said Roseanne Cheng, co-chair of the API ERG and a Lab physicist. "For the API ERG, this event shows that the Lab is listening to us and that cultural integrity is important."

Shared history, linked cultures

Like many street names at Los Alamos, such as Trinity Drive and Bikini Atoll Road, Enewetak Drive is a nod to aspects of the Lab's earliest days.

Like Bikini, Enewetak Atoll is part of the Marshall Islands in the Pacific. The Lab conducted nuclear weapons tests in the Marshall Islands from 1946 through 1962 at what would become known as the Pacific Proving Grounds.

During a 10-year period, 43 nuclear devices were tested on Enewetak Atoll, including Ivy Mike, which was the first demonstration of the principles underlying the hydrogen bomb.

"Enewetak—and the Marshall Islands—are an important part of the nation's testing history and, in particular, the Lab's legacy of scientific achievement," said Lab historian Roger Meade, who traveled to Enewetak with the Lab's weapons program staff in the 1980s and early 2000s and has written extensively about nuclear testing in the Marshall Islands.

Enewetak Atoll

The Marshall Islands' official language is Marshallese (called Ebon by the locals), and English is also spoken there today. The origin and meaning of "Enewetak" is not certain, though at least one scholar has suggested it may mean "land between East and West," according to the 2004 special report "CASTLE BRAVO: Fifty Years of Legend and Lore," by Thomas Kunkle and Byron Ristvet.

It's also uncertain when the atoll's name was first westernized to the Eniwetok spelling and by whom, according to Meade.

After years of European influence, followed by a Japanese occupation, the Marshall Islands were captured by the United States during World War II. The United Nations allowed the U.S. to retain control of the islands, which enabled Enewetak and other atolls to be used for nuclear testing.

Approximately 150 Enewetak residents were relocated in December 1947 to nearby Ujelang Atoll in preparation for the nuclear tests that would begin the following spring. The first test on Enewetak was called X-ray and took place on April 14, 1948. The last test on Enewetak Atoll, called Fig, took place in August 1958. The Lab's weapons testing outside the Marshall Islands continued until an October 1958 moratorium suspended nuclear tests.

After years-long decontamination efforts, residents eventually were able to return, though part of the atoll is still uninhabitable. Today's population is just under 700, according to the most recent estimations available.

Eniwetok to Enewetak

In 1974, the U.S. government changed its official spelling of Eniwetok to Enewetak in an effort to better reflect the pronunciation of the name by Marshall Islands natives, according to *Elements of Controversy: The Atomic Energy Commission and Radiation Safety in Nuclear Weapons Testing, 1947-1974.*

At Los Alamos, "this idea to change the spelling of the street sign has been discussed through the years," said senior historian Alan Carr. Carr is part of the Lab's National Security Research Center, which houses millions of classified records from the weapons testing era, including those from the Pacific Proving Grounds.

"By changing the name on Lab street signs," says Cheng, "we're showing we're aware of and respect the identity of the Enewetak people, their culture and their pronunciation."

Carr and Meade agree.

"Enewetak is incredibly important in our country's history," says Meade, "and it's right for the Lab to be appreciative and respectful of the Marshallese."

*Arnold Eng (*left*) and Roseanne Cheng (*right*), members of the Asian Pacific Islander Employee Resource Group, hold the newly unveiled street sign.*

A Tale of Two Bomb Designs

Why were both **Little Boy** and **Fat Man** created?

By Julie Miller, librarian-archivist, National Security Research Center

Little Boy and Fat Man.

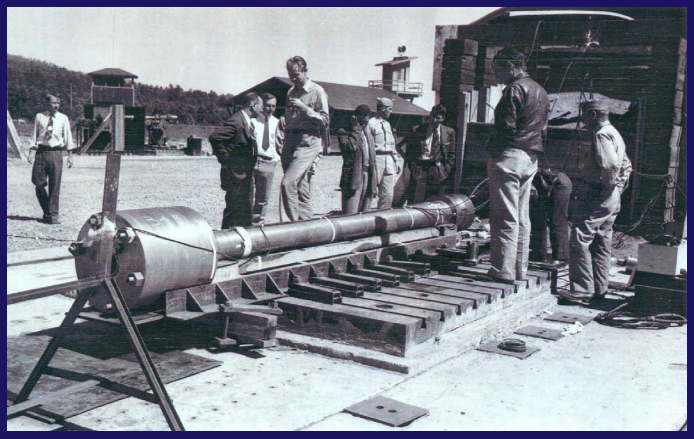
Two types of nuclear weapons were developed at the Los Alamos wartime lab in an effort to help end World War II. Both would be released above Japan just days apart in August 1945, and just weeks after the July 16 Trinity test in the New Mexico desert.

These weapons were, however, as different as their monikers imply. Little Boy was a uranium, gun-type weapon, whereas Fat Man was a plutonium, implosion-style weapon. Two types were needed because there was only enough uranium for one gun-type weapon, and the U.S. government knew it would need to make more than one weapon. The insurmountable challenges associated with a plutonium gun-type design prompted the shift to the implosion-style weapon.

Creating atomic bombs

Consider the setting of the Second World War. Amid the impending resolve to end the war and stop the daily death toll of thousands, the scientists, engineers, and military personnel at Los Alamos intensely collaborated over 27 months to build two types of bombs.

Wartime troubles were unavoidably linked to practical concerns, such as fitting bombs into the B-29 bomb bay to carry the weapons into combat and building components that could tolerate the harsh conditions of high-altitude falls. Developing bombs was not a routine engineering project, according to *Critical Assembly: A Technical History of Los Alamos during the Oppenheimer Years, 1943–1945*. Many gaps existed in the scientific information needed to create the atomic bombs. It would require a full understanding of nuclear physics, chemistry, explosives, and hydrodynamics.



The failed plutonium gun-type design, called Thin Man.

"The most daunting technical problem facing Los Alamos," said Laboratory historian Roger Meade, "was how to fashion the limited quantities of two very different [fissile] materials, uranium-235 and plutonium-239, into combat weapons." Proper bomb design broadly depends on sufficient fissile material to sustain a nuclear reaction; assembly technology, such as gun-type or implosion; and the necessary specifications, such as dimensions, reliability, and efficiency.

The simplest bomb design is the gun-type assembly device, in which an explosive propellant is used to fire one subcritical piece of fissile material down a "gun barrel" into another piece of fissile material.

"[Little Boy's design] is much simpler than Fat Man," said Glen McDuff, retired Los Alamos weapons scientist. "[Little Boy] could be tested without an explosive test and was guaranteed to work."

Early on, the gun-type design was thought to be feasible for both uranium-235 and plutonium-239. As such, research for the lower-priority implosion design was viewed as a program to fall back on should unexpected problems arise in developing the gun-type design. However, priorities were soon to shift.

Why did we need both Little Boy and Fat Man?

From the U.S. military's point of view, it would take more than one bomb to help end World War II. Originally, the plan was to develop two gun-type bombs, a uranium-235 device named Little Boy and a plutonium-239 device named Thin Man, according to *Critical Assembly*.

However, when it became apparent that the Thin Man bomb had unworkable challenges and would not be successful in combat, a different type of bomb had to be designed.

General Leslie Groves, leader of the Manhattan Project (the U.S. government's top-secret effort to create the atomic bomb), did not want to lose the time and money spent on plutonium production. As such, within days of Lab Director J. Robert Oppenheimer disclosing the problems with Thin Man, scientists shifted their focus to an implosion assembly method that could utilize plutonium. This implosion design would come to be named Fat Man.

Little Boy and Fat Man used different components and entirely separate methods of construction in order to successfully detonate, according to the Atomic Heritage Foundation's article "Science behind the Atom Bomb."

The original Fat Man (top) *and Little Boy* (bottom) *atomic bombs created at the secret lab in Los Alamos.*

Why wasn't Little Boy tested with Fat Man?

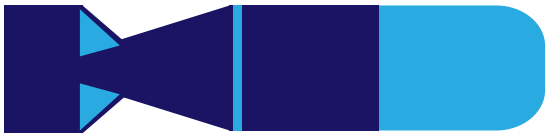
A full-scale test of Little Boy was impossible because producing one Little Boy would use all of the purified uranium-235 that had been collected at the time. The separation of the uranium-235 isotope from uranium-238 in natural uranium was an expensive and difficult process that could not be relied upon to deliver material quickly, according to *Critical Assembly*. However, many tests were run on bombs that had most of the components minus the fissionable material, according to Groves's autobiography *Now It Can Be Told: The Story of the Manhattan Project*.

What's what:

A look at the Manhattan Project–era weapons

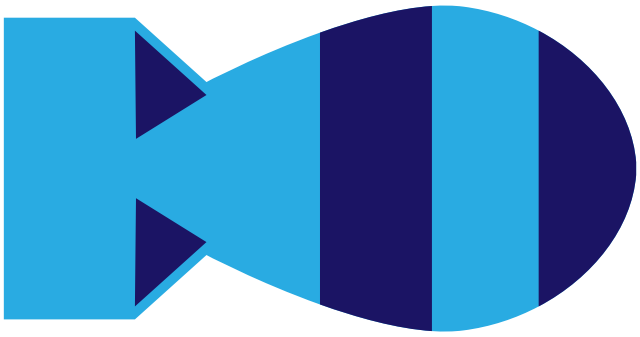
Little Boy

The first of two atomic bombs to be used in combat, the uranium gun-type weapon was released above Hiroshima on August 6, 1945. The weapon was 9,700 pounds, 10 feet long, and just over 2 feet in diameter.



Fat Man

The second of two atomic bombs to be used in combat, the plutonium implosion-type weapon was released above Nagasaki on August 9, 1945. The bomb was a weaponized version of The Gadget that was detonated during the Trinity test in the New Mexico desert on July 16, 1945. Fat Man was 10,800 pounds, nearly 11 feet long, and 5 feet in diameter.

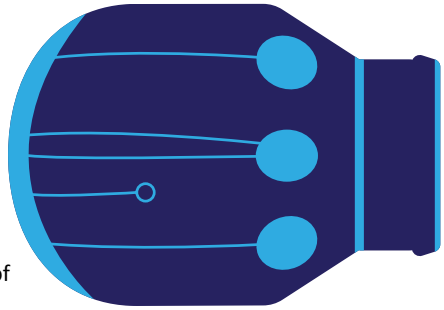


Thin Man

The attempt to develop a gun-type plutonium weapon was not successful and ultimately abandoned.

The Gadget

The world's first-ever atomic device detonation occurred in the New Mexico desert during the Trinity test. It verified that an implosion-type plutonium bomb (Fat Man) would be successful when released above Japan just weeks later. The explosive power from The Gadget's detonation was equivalent to around 21,000 tons of TNT; its mushroom cloud grew to about 3,280 feet wide with a column of smoke in excess of 40,000 feet high.



Owing to confidence in the uranium-235 gun-type bomb design and the lack of extra fissile material for experimental trials, testing it before combat use was deemed unnecessary, according to Alan Carr, senior historian at the Lab's National Security Research Center. Moreover, field tests conducted with uranium-235 prototypes provided assurance about the gun-type assembly method.

"Although a full-scale nuclear explosive test was not conducted, every component of Little Boy was rigorously tested right here at Los Alamos," Carr said. "The scientists were not simply confident Little Boy would work, they knew Little Boy would work—it was a mathematical certainty."

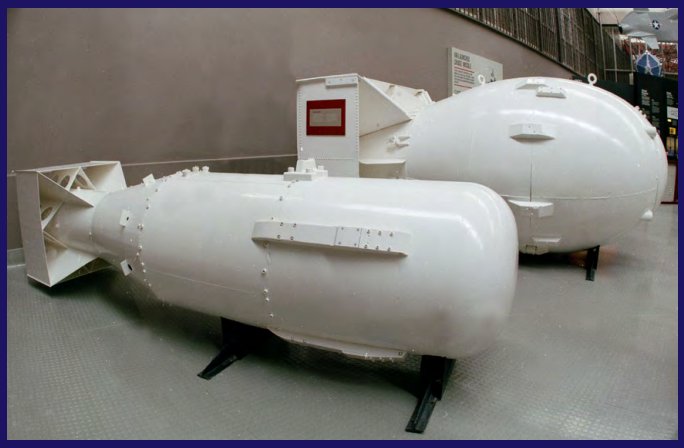
A third bomb?

The question often arises: Did the United States have a third bomb ready for combat, following the release of Little Boy and Fat Man above Hiroshima and Nagasaki?

Yes, there was indeed a third bomb forthcoming if Japan didn't surrender after the second bomb was dropped. This third bomb, sometimes referred to as the second Fat Man or the Third Shot, was another plutonium-239 implosion bomb.

Groves's directive, written on July 23, 1945, just weeks before Little Boy and Fat Man were released, stated that additional bombs would be delivered for use against the Japanese targets once they became available. The plutonium production facilities at Hanford in Washington state continued to work at capacity. Production of materials for assembly of a third bomb was well underway when Japan officially surrendered on September 2, 1945.

A copy of Groves's letter is part of the NSRC's unclassified collections.



Models of Little Boy and Fat Man.

HOW NUCLEAR WEAPONS TESTS WERE NAMED

By Julie Miller, librarian-archivist, National Security Research Center

What do Galileo, Husky Pup, Turquoise, and Barracuda have in common? They are names of nuclear weapons tests conducted at what is now called the Nevada National Security Site (NNSS). Over 1,000 U.S. nuclear tests were conducted at various sites between 1945 and 1992, when explosive testing ended. Each of the tests was inaugurated with a name, as documented in the Lab's vast weapons test collections housed in the National Security Research Center (NSRC).

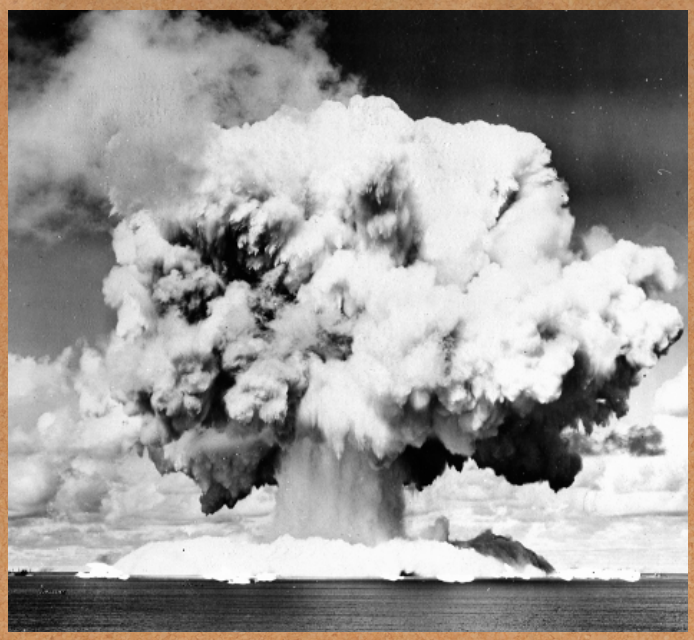
Nuclear weapons test names were assigned to protect classified information about nuclear weapons and maintain security. This has been true from the beginning with Trinity, the first atomic bomb test in 1945. Lab Director J. Robert Oppenheimer later said the test name may have been inspired by his love of poetry.

How test names were chosen

Weapons tests were named differently depending on which government organization sponsored the test. Initial test names came from the Joint Army/Navy Phonetic Alphabet, which was developed in 1941 and used by all branches of the U.S. military to improve radio communications. It was referred to as the Able Baker alphabet:

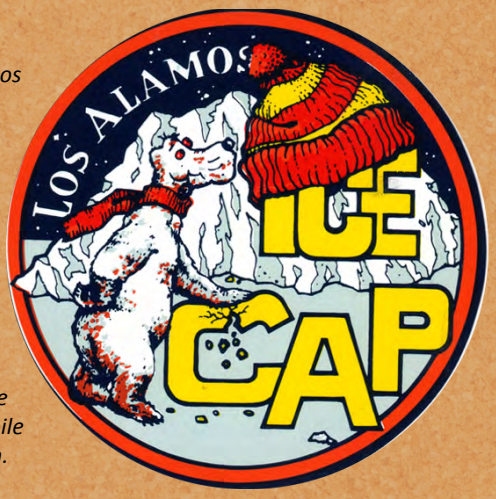
Able, Baker, Charlie, Dog, Easy, Fox, George, How, Item, Jig, King, Love, Mike, Nan, Oboe, Peter, Queen, Roger, Sugar, Tare, Uncle, Victor, William, X-ray, Yoke, Zebra

As the United States, and in particular the Lab, entered into a post–World War II testing period, nuclear weapons tests were named in alphabetical order for each operation series, beginning with the Crossroads Able test on July 1, 1946, at Bikini Atoll in the Pacific.



Able was the first weapons test following the combat deployment of the Los Alamos–created Little Boy and Fat Man atomic bombs, as the no-longer-secret lab transitioned into an era of weapons testing.

To avoid duplication of test names, the Able Baker alphabet was no longer used after 1952.



Ron Cosimi, Los Alamos test director from 1988–1998, chose names for tests sponsored by the Lab at that time. They included the last explosive tests and the beginning of the subcritical tests that formed the foundation for the contemporary Stockpile Stewardship Program.

Logo patch for the Vaughn test, conducted on March 15, 1985, which was part of the Operation Grenadier test series.

Since about 1973, the 112 tests co-sponsored by the Department of Defense (DoD) were named by the Code Word, Nickname, and Exercise Term (NICKA) system. The NICKA formula required a two-word name in which the first two letters of the first word (Di, Hu, Hy, or Mi) were preassigned to various DoD agencies. For example, the second word of the first test started with "A," the second word of the second test started with "B," and so on. As such, the DoD-sponsored tests had names like Diamond Ace, Husky Pup, Hybla Gold, and Minty Delight.

According to publications from the DoD, Department of Energy (DOE), and their predecessor organizations, they sponsored weapons tests for 46 years. The purpose of the tests was to advance weapons design, determine weapons effects, and verify weapons safety. Though the overall weapons testing program was collaborative, it was ultimately overseen by the president of the United States.

The DOE did not have a formal naming system like the DoD. The national laboratories chose the names. Often, a test series contained test names that were categorically related, such as New Mexico counties (Socorro, Rio Arriba, De Baca) and fish species (Tuna, Bonefish, Pike). Other sources of inspiration included famous scientists (Newton, Galileo, Pascal), colors (Purple, Chartreuse, Sienna), sailing terms (Jib, Mast, Keel), and birds (Wagtail, Merlin, Tern).

"If [the Lab] was planning to run 10 tests in a fiscal year, I would choose 10 names of Texas cities, for example," Cosimi said, adding that this was his favorite category because he enjoyed creating logos for the Texas city names, which included Abilene, Laredo, and Waco. "I named about 30 tests and experiments and was responsible for about 100 logos for tests."

"I enjoyed picking names since that gave me a chance to indulge in my creative side when I had to come up with a logo. Sometimes we ran out of names when additional tests were added, then I would choose previously unused names," Cosimi said, pointing to the 1992 Divider test, the name of which came from an old category of tools and implements.

"After I retired," Cosimi said, "my successors used movie names and then branched off into many names, randomly chosen—even some names of family members."

"Camaraderie is the number one reason I supported the practice [of creating patches and logos]," Cosimi said. "There always was an interschool rivalry between the labs at NTS [Nevada Test Site, now NNSS], and the teams from Los Alamos proudly wore their caps with the event they were working on."

Ron Cosimi remembers

Ron Cosimi, Los Alamos test director from 1988 to 1998, chose names for tests sponsored by the Lab during that time.

The Galileo test on September 2, 1957, was part of the Operation Plumbbob series.

Retired LANL test director Ron Cosimi's jacket and hats showing test logos. Logos were designed for many tests and made into patches that could be applied to clothing. (Photo courtesy of Ron Cosimi.)

"The Atomic Testing Museum in Las Vegas, Nevada, probably has most of the patches/logos," Cosimi said. He and others have donated patches there. The NSRC collections also contain dozens of test logos and patches.

John Hopkins remembers

"The Lab's Testing (J) Division was responsible for Lab-sponsored nuclear tests, and this included the selection of their names," said John Hopkins, who worked at the Lab beginning in 1960 as a nuclear physicist and retired 34 years later as the associate director responsible for the nuclear weapons program.

Hopkins remarked that, often, members of J Division would volunteer a list of names. When Hopkins was the division leader, he submitted his then-teenage daughter Anna's proposed list of games of skill and chance to the DOE Division of Military Application in Washington, DC, for approval as test name suggestions. The list included Rummy, Chess, and Baseball, which were accepted and appeared in the late '70s and early '80s. Hopkins participated in 170 nuclear tests, including five atmospheric tests, during his career.

Byron Ristvet remembers

At one time, there was a "Name a nuke" suggestion box in the Albuquerque DNA facility hallway, recalled Byron Ristvet, a retired DoD scientist. The suggestion box provided the starting preassigned and alphabetical letters to be used for an upcoming test. "Some of the suggestions were actually used for tests," Ristvet said.

*NSRC senior historian Alan Carr (*right*) discusses artifacts preserved in the National Security Research Center, including patches from various nuclear tests, with retired test director Ron Cosimi (*center*) and former associate director John Hopkins (*left*).*

Tom Kunkle remembers

Retired weapons scientist Tom Kunkle recalls one test that was named twice.

"The initial nickname for the 24 September 1981 test was 'Craps,' a name from the list of games of skill and chance from Anna Hopkins. The nickname was [deemed] unacceptable. The powers that be didn't want us [shooting] craps at the test site," said Kunkle. "So the test was renamed to Cernada [little cinder] from the most recent list of New Mexico place names. I hoped at the time that someone in Russia wasted a lot of brain sugar wondering if the nickname had anything to do with the nuclear device."

THOSE WHO BELIEVED IN OPPENHEIMER

In 1953, J. Robert Oppenheimer received an ultimatum.

The Atomic Energy Commission (AEC) sent the "father of the atomic bomb" and former Los Alamos director a letter outlining two options: give up his Q clearance and role as advisor or appear before a board to prove that he wasn't a threat to national security.

Oppenheimer chose the latter.

The ensuing saga peaked with a four-week, closed-door hearing in the spring of 1954, after which Oppenheimer's security clearance was formally revoked. The long, complex affair involved a tangle of questionable charges, divided opinions, national security concerns, loyalties, egos, and vendettas.

Story by Mia Jaeggli, digital archivist, National Security Research Center

Comic dramatizations by Paul Ziomek, visual designer, Multimedia Production

Oppenheimer and AEC chairman Lewis L. Strauss were at the center of events, though an important part of the historical record is Fred L. Ribe's petition and the 493 other Los Alamos scientists who risked harming their careers by signing it to protest Oppenheimer's ordeal. The one-page letter, addressed to President Dwight Eisenhower and the AEC commissioners, "[objected to] the decision and the grounds for it," as Ribe later wrote.

This petition—and Strauss's written response—were donated by Ribe and are part of the unclassified historical collections in the Lab's National Security Research Center (NSRC).

Oppenheimer and the H-bomb

Theoretical physicist Oppenheimer led the Manhattan Project's clandestine lab in Los Alamos from 1943 to 1945. In just 27 months, Oppenheimer and his team secretly created the first nuclear weapons, a scientific achievement that brought the world into the Atomic Age and helped end history's bloodiest conflict.

After World War II, Oppenheimer left the lab and soon became the director of the Institute for Advanced Study in Princeton and the chairman of the AEC's General Atomic Commission (GAC). (The AEC was the precursor to today's Department of Energy.) Through his work on the GAC from 1947 to 1953, Oppenheimer was the leading national scientific advisor on the future of nuclear weapons development.

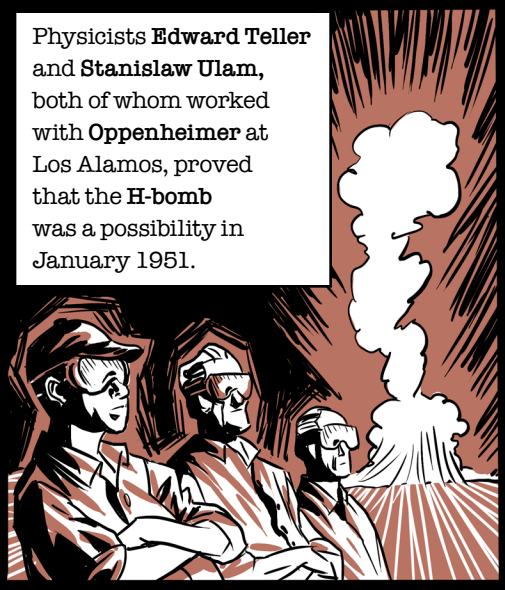
Oppenheimer was initially wary of the moral implications and scientific feasibility of pursuing the development of a new and more powerful type of nuclear weapon called a hydrogen bomb, and he voted in 1949 with the GAC that an accelerated program of thermonuclear weapon (H-bomb) research and production wasn't advisable. Oppenheimer didn't oppose H-bomb research but "hoped that [it] would 'never be produced,'" according to the Oppenheimer biography *American Prometheus.*

Oppenheimer's stance rankled President Harry S. Truman and Strauss. Both feared the Soviet Union would build the H-bomb before the U.S. and pushed for the program.

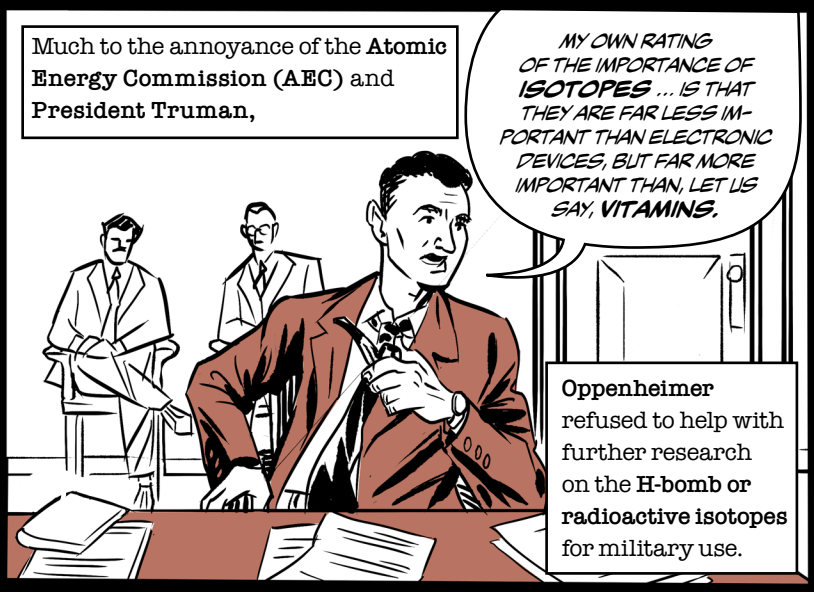
NSRC historian Alan Carr said that at the time, "People thought of the H-bomb as a weapon with the massive destructive ability to take out a whole city. But thermonuclear weapons are far more flexible than they understood back then."

From left: *J. Robert Oppenheimer, Edward Teller, and Lewis Strauss. All suffered personal and professional consequences following the revocation of Oppenheimer's security clearance in 1954.*

Physicists **Edward Teller** and **Stanislaw Ulam,** both of whom worked with **Oppenheimer** at Los Alamos, proved that the **H-bomb** was a possibility in January 1951.



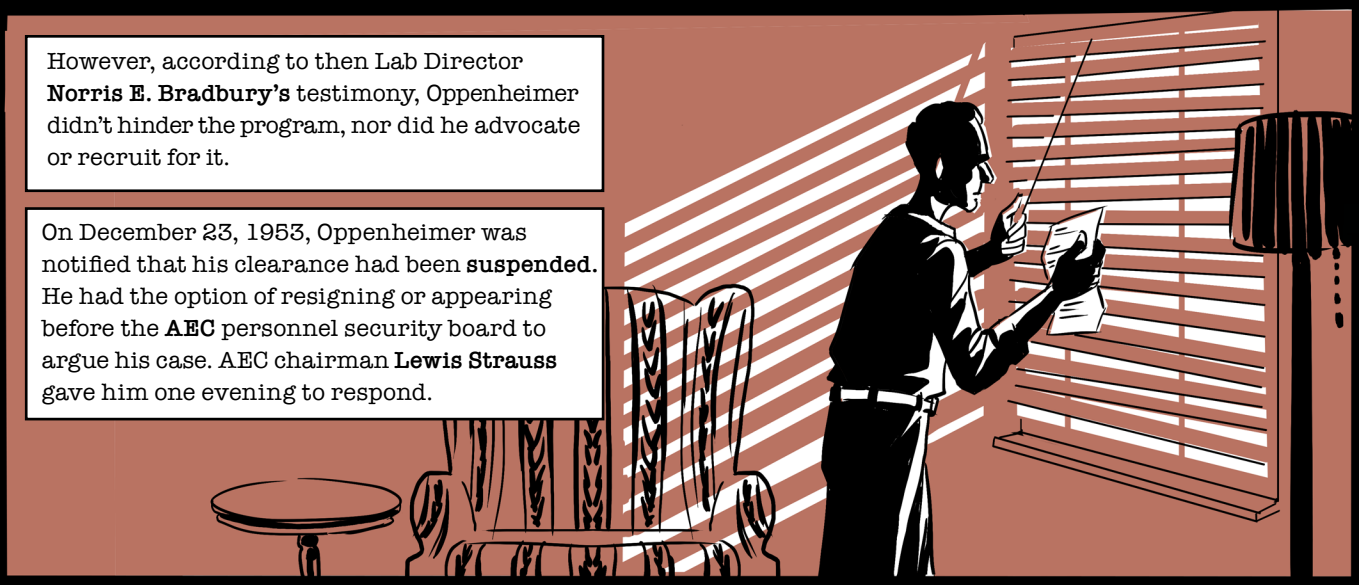
Much to the annoyance of the **Atomic Energy Commission (AEC)** and **President Truman,**



Oppenheimer refused to help with further research on the **H-bomb or radioactive isotopes** for military use.

However, according to then Lab Director **Norris E. Bradbury's** testimony, Oppenheimer didn't hinder the program, nor did he advocate or recruit for it.

On December 23, 1953, Oppenheimer was notified that his clearance had been **suspended.** He had the option of resigning or appearing before the **AEC** personnel security board to argue his case. AEC chairman **Lewis Strauss** gave him one evening to respond.



Of the **40 witnesses** called to testify, 28 were fiercely loyal to Oppenheimer and highly respected, including Nobel prize winners **Isidor Rabi** and **Enrico Fermi,** both of whom worked with him at the wartime Los Alamos lab.

Thus, lines were drawn in the scientific community. After Truman ordered the H-bomb's development in January 1950 and physicists Edward Teller and Stanislaw Ulam, both of whom worked with Oppenheimer at Los Alamos, proved a year later that the H-bomb was possible, Oppenheimer's stance remained unchanged. According to then Lab Director Norris E. Bradbury's testimony, Oppenheimer didn't hinder the program, nor did he advocate or recruit for it.

However, Truman and Strauss continued to believe that Oppenheimer was "persuading . . . outstanding scientists not to work on the hydrogen-bomb" and was therefore actively obstructing the program, according to *American Prometheus.* Unfortunately, the GAC report and sour professional relationships became the impetus for the ordeal that followed.

Strauss vs. Oppenheimer

Before there was a whisper of revoking Oppenheimer's clearance, his relationship with Strauss stacked the odds against him. Popular historical narrative argues that Strauss had a personal vendetta and intended to destroy Oppenheimer's credibility and career.

The most significant rift between the two men was the H-bomb, but disagreement turned to animosity during a June 1949 AEC Joint Committee Session concerning radioactive isotopes. While this happened many months before Truman's H-bomb order, Oppenheimer's statements in his testimony may have set the stage for Strauss's later actions.

Strauss believed that radioactive isotopes had military value and argued against exporting them. However, with little patience for those he considered intellectually inferior, Oppenheimer publicly humiliated Strauss by saying, "My own rating of the importance of isotopes . . . is that they are far less important than electronic devices, but far more important than, let us say, vitamins."

In response, Strauss didn't hide his look of hatred. Oppenheimer had publicly revealed that Strauss knew little about physics, particularly nuclear science.

"Somewhere along the way, [Oppenheimer] had learned to go for the jugular," said AEC general counsel Joseph Volpe in *The Ruin of J. Robert Oppenheimer.*

Accusations and charges

On December 23, 1953, Oppenheimer was notified that his clearance had been suspended. He had the option of resigning or appearing before the AEC personnel security board to argue his case. Strauss gave him one evening to respond.

The next day, Oppenheimer wrote, "[Resigning] would mean that I accept and concur in the view that I am not fit to serve this government that I have now served for some twelve years. This I cannot do."

The numerous charges outlined in the eight-page document concerned his "character, associations, and loyalty." Most of the letter outlined his associations with communist sympathizers and, most damning, his lies during FBI interrogations to protect a friend. The most alarming accusation, at least for the science community, was the last charge that Oppenheimer willfully obstructed H-bomb development.

The next day, Oppenheimer wrote, "[Resigning] would mean that I accept and concur in the view that I am not fit to serve this government that I have now served for some twelve years. This I cannot do."

Testimony: Loyalties and betrayals

A three-man board would decide Oppenheimer's fate—though the hearing was inarguably unfair. The board had access to a 3,000-page FBI file on Oppenheimer and bugs provided by Strauss, and the prosecution's witnesses were kept secret—all hampering defense efforts.

Of the 40 witnesses called to testify, 28 were fiercely loyal to Oppenheimer and highly respected, including Nobel Prize winners Isidor Rabi and Enrico Fermi, both of whom worked with him at the wartime Los Alamos lab.

Rabi refused to be baited into criticizing Oppenheimer's character or misgivings about the H-bomb. Rabi famously said, "We have an A-bomb . . . what more do you want, mermaids? This is just a

tremendous achievement. If the end of that road is this kind of hearing, which can't help but be humiliating, I thought it was a pretty bad show. I still think so."

Despite the overwhelming support for Oppenheimer, two testimonies held more weight than all the others combined: those of Manhattan Project Leader General Leslie R. Groves and Edward Teller.

Groves was the first witness to testify on behalf of Oppenheimer. He defended his selection of Oppenheimer as director of the wartime Los Alamos lab and noted Oppenheimer's achievements despite FBI suspicions. However, during the prosecution's cross-examination, Groves was asked, considering the AEC's 1954 security requirements and Oppenheimer's past associations, if granting a clearance to Oppenheimer would "endanger" national security.

According to Lab historian Roger Meade, "For the junior scientists, Oppenheimer's treatment caused a visceral reaction, and they felt that the Oppenheimer incident was an attack on science, not just [the man]."

Groves stated, "I don't care how important the man is . . . I would not clear Dr. Oppenheimer today if I were a member of the Commission on the basis of this interpretation." Groves went on to say that if the requirements were different, he'd have a different opinion. Groves was "waffling," but, according to *American Prometheus*, Strauss had threatened to accuse him of covering up Oppenheimer's lies.

Teller began with a glowing testimony of Oppenheimer's work and loyalty to the United States. However, none of that mattered when he said, "If it is a question of wisdom and judgment, as demonstrated by actions since 1945 [when World War II ended following the release of the atomic bombs], then I would say one would be wiser not to grant clearance." By "actions," Teller referred to Oppenheimer's "bad advice" and lack of support for Teller's H-bomb, according to *The Ruin of J. Robert Oppenheimer.*

The scientific community regarded the testimony as a betrayal, and many former colleagues shunned Teller. "The hatred at the Lab was so thick, you could cut it with a knife," recalled retired associate director John Hopkins, who was working at the Lab then.

2-to-1 verdict

After reviewing the secret FBI report and the 3,300-page hearing transcript, the board made its recommendation on May 27. "The chemist scornfully said no; the businessman and university president . . . said yes," according to an article in *Time* magazine. Oppenheimer's clearance was formally revoked on June 29, 1954, the day before it would have expired.

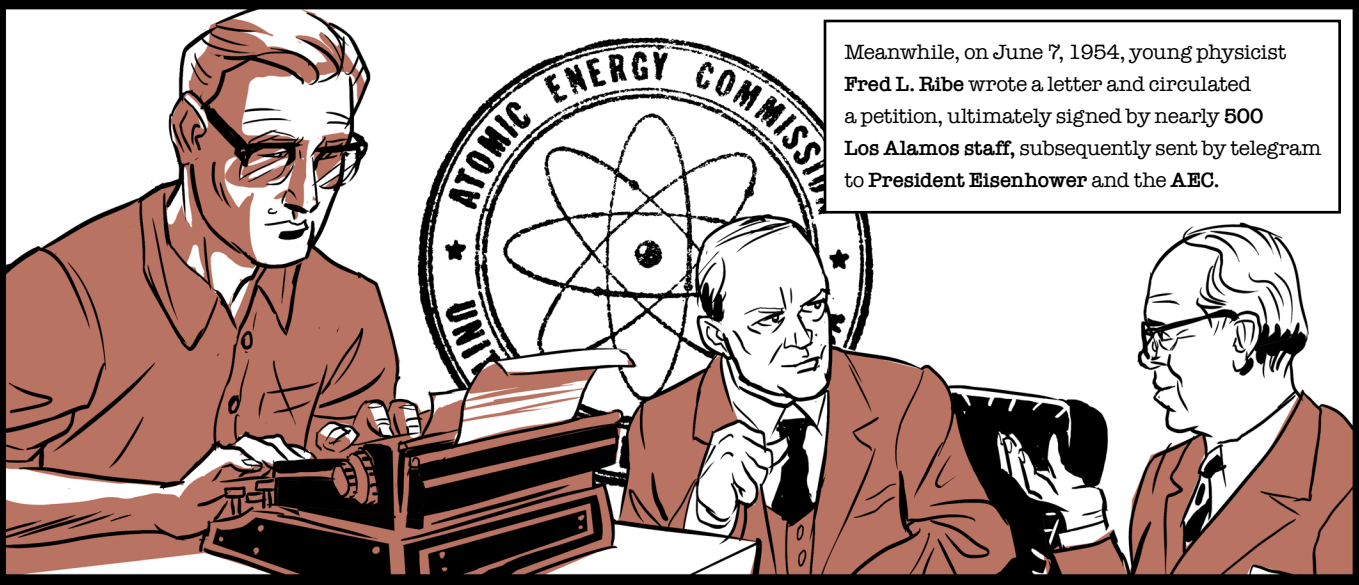
The board's final statements emphasized Oppenheimer's loyalty and his "unusual ability . . . to keep vital secrets" but protested his lack of "enthusiastic support" for the H-bomb program, his lies to the FBI, and his alleged vulnerability to coercion by previously known communist members or sympathizers, including his brother Frank Oppenheimer.

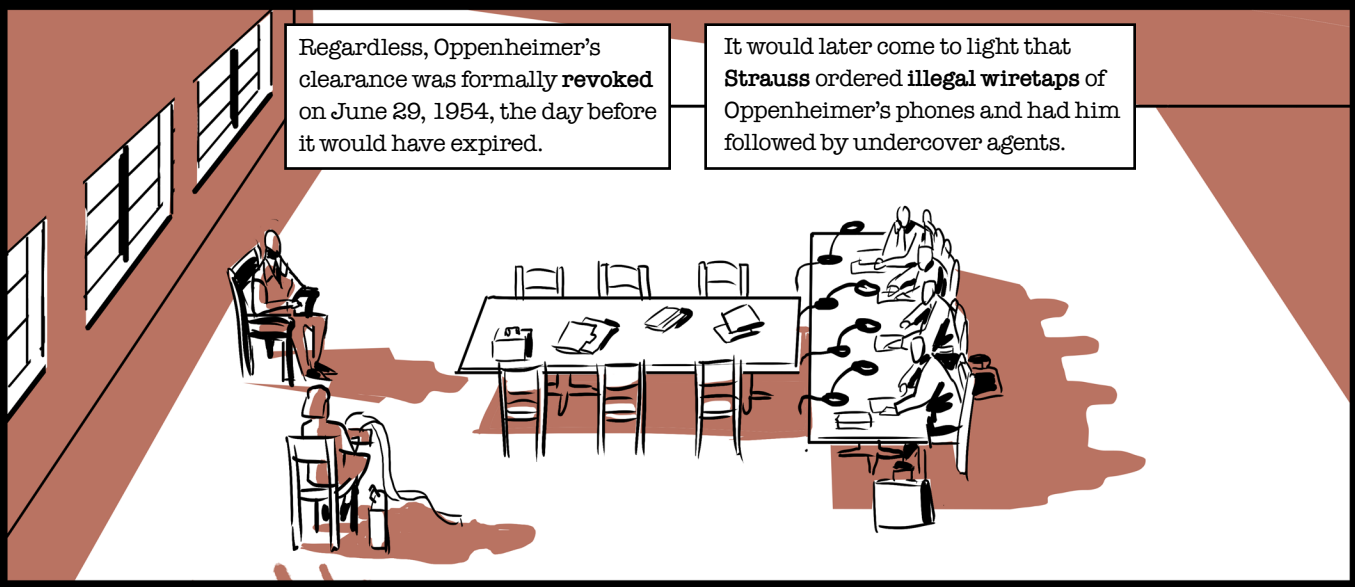
Strauss is still considered the motivating force behind the revocation of Oppenheimer's clearance. Before and during the hearing, Strauss ordered illegal wiretaps of Oppenheimer's phones and had him followed by undercover agents, according to *American Prometheus*. Furthermore, Strauss allegedly bribed AEC commissioners, including Henry DeWolf Smyth, who was the lone dissenter on the board, according to *The Ruin of J. Robert Oppenheimer.*

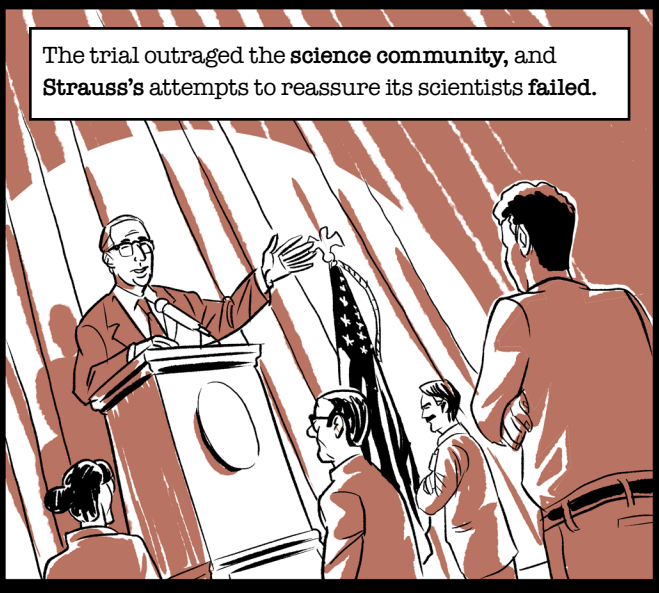
Outrage and a petition

"All scientists," according to *American Prometheus*, "were now on notice that there could be serious consequences for those who challenged state policies."

In Los Alamos, the events felt personal. According to Lab historian Roger Meade, "For the junior scientists, Oppenheimer's treatment caused a visceral reaction, and they felt that the Oppenheimer incident was an attack on science, not just [the man]. The sentiment of the scientists was, 'We're here to do science . . . and now they're attacking [the man] that led us here.'"


ATOMIC ENERGY COMMISSION
Meanwhile, on June 7, 1954, young physicist **Fred L. Ribe** wrote a letter and circulated a petition, ultimately signed by nearly **500 Los Alamos staff,** subsequently sent by telegram to **President Eisenhower** and the **AEC.**


Regardless, Oppenheimer's clearance was formally **revoked** on June 29, 1954, the day before it would have expired.
It would later come to light that **Strauss** ordered **illegal wiretaps** of Oppenheimer's phones and had him followed by undercover agents.

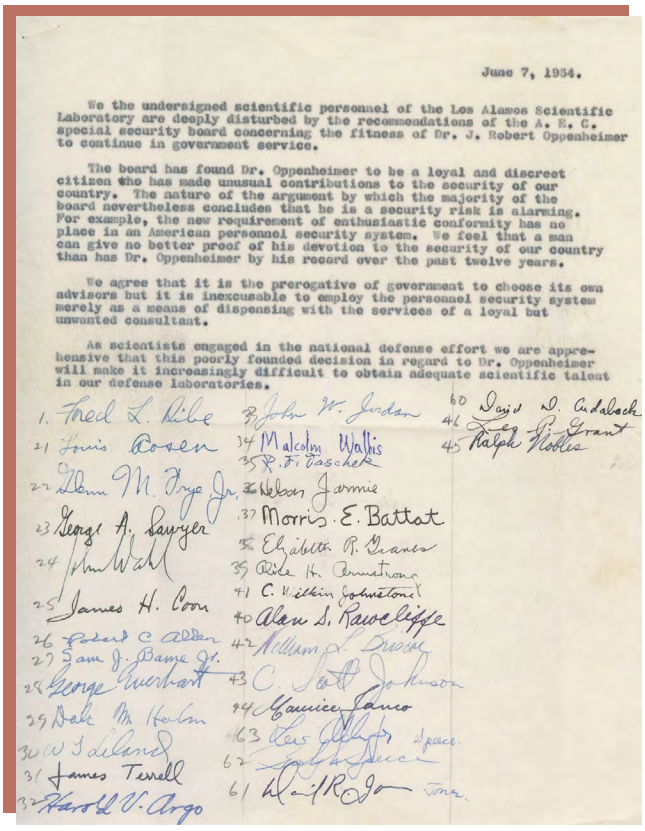

The trial outraged the **science community,** and **Strauss's** attempts to reassure its scientists **failed.**


In the end, Strauss's **reputation** was tarnished. The Senate **rejected** his nomination for **Secretary of Commerce** in 1959.

On June 7, 1954, junior physicist Fred L. Ribe wrote a letter and petition protesting the revocation, subsequently sent by telegram to Eisenhower and the AEC.

"The nature of the argument by which the majority of the board nevertheless concludes that he is a security risk is alarming," Ribe wrote. " . . . We are apprehensive that this poorly founded decision . . . will make it increasingly difficult to obtain adequate scientific talent in our defense laboratories."

Ribe sent copies of the petition to nearly 3,000 mail stops around the Lab. He gathered 282 signatures within a day; more than 80 percent of the Theoretical Division signed it, according to a June 9, 1954, article in the *Albuquerque Journal*. Soon, 493 scientists had added their names, including future Lab Director Harold M. Agnew, who worked with Oppenheimer at the wartime Los Alamos lab.



June 7, 1954.

We the undersigned scientific personnel of the Los Alamos Scientific Laboratory are deeply disturbed by the recommendations of the A. E. C. special security board concerning the fitness of Dr. J. Robert Oppenheimer to continue in government service.

The board has found Dr. Oppenheimer to be a loyal and discreet citizen who has made unusual contributions to the security of our country. The nature of the argument by which the majority of the board nevertheless concludes that he is a security risk is alarming. For example, the new requirement of enthusiastic conformity has no place in an American personnel security system. We feel that a man can give no better proof of his devotion to the security of our country than has Dr. Oppenheimer by his record over the past twelve years.

We agree that it is the prerogative of government to choose its own advisors but it is inexcusable to employ the personnel security system merely as a means of dispensing with the services of a loyal but unwanted consultant.

As scientists engaged in the national defense effort we are apprehensive that this poorly founded decision in regard to Dr. Oppenheimer will make it increasingly difficult to obtain adequate scientific talent in our defense laboratories.

1. Fred L. Ribe
21 Louis Rosen
22 Glenn M. Frye Jr.
23 George A. Sawyer
24
25 James H. Coon
26
27 Sam J. Rame Jr.
28 George Kuerti
29 Dale M. Holm
30
31 James Terrell
32 Harold V. Argo
33 John W. Jordan
34 Malcolm Wallis
35
36 Nelson Jarmie
37 Morris E. Battat
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39
41
40 Alan S. Rawcliffe
42
43
44
45 Ralph Nobles
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62
61
60 David D. Cudlaclk

Los Alamos physicist Fred Ribe collected nearly 500 signatures from Lab staff in 1954, shortly after first Lab Director J. Robert Oppenheimer's security clearance was revoked following accusations of disloyalty, among other issues.

Ribe was three years out of his Ph.D. physics program at the University of Chicago and had joined the Lab in 1951. He knew he could be punished for spearheading a mass protestation of Oppenheimer's treatment.

Meade, who was Ribe's colleague, described him as "an extraordinarily nice guy. Earnest but very serious. [Fred] wanted to be sure that we were always doing the right thing."

"Fred was the spokesperson for everyone at the Laboratory who believed in Oppenheimer," Meade said. The petition was given to the board members at Oppenheimer's hearing. It's not known what Oppenheimer's reaction to the petition was.

Operation "Butter-Up"

After Oppenheimer lost his clearance, Strauss penned a letter to Ribe and the Lab at large.

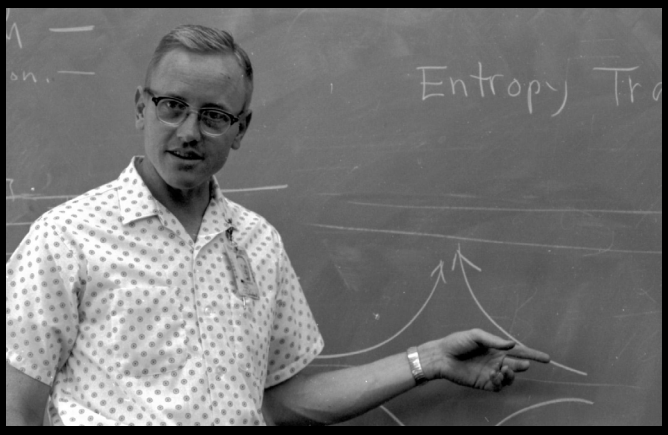
"The Atomic Energy Commission does not believe that any government servant—scientist or engineer or administrator—should slant his advice or temper his professional opinion because of apprehension that such advice or opinion might be unpopular now or in the future. We certainly do not want 'yes men' in the employ of the Atomic Energy Commission," Strauss wrote.

Strauss's attempt to offer assurances failed. A July 16, 1954, article from an unknown New Mexican newspaper stated, "The AEC prosecutor's constant effort to attribute evil motives to Dr. Oppenheimer's [controversial opinions], has inevitably made the scientists think that Strauss's letter to Los Alamos is 'less than candid.'"

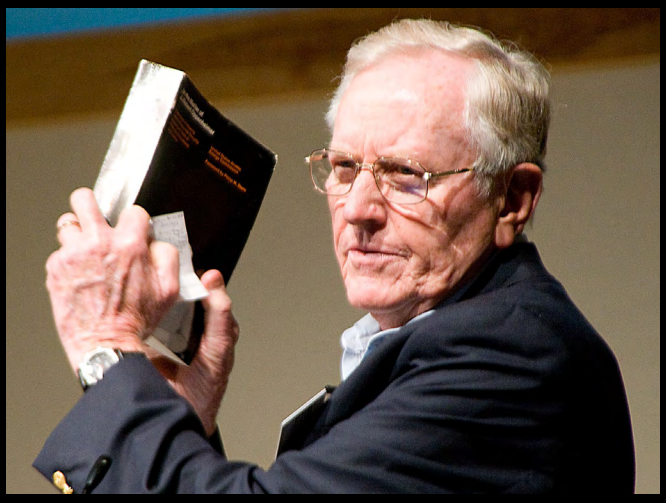
Strauss tried again, this time with a visit to the Lab. During "Operation Butter-Up," as it was referred to in the *Santa Fe New Mexican*, scientists angrily told Strauss that the hearing had created a "very grave morale problem." According to Meade and Carr, local anecdotes suggest that Strauss met the scientists' outrage with flattery and charm, though his approach likely didn't assuage sentiments of betrayal and anger.

The Outcome: Strauss

Despite his efforts, Strauss's reputation was tarnished. The Senate rejected his nomination for Secretary of Commerce in 1959. The rejection was the end to Strauss's 42-year public career. Largely retired, he published his memoir and lived on a cattle-breeding farm until his death in 1974.



Physicist Fred Ribe came to the Lab in 1951. It's unclear if he ever knew former Lab Director J. Robert Oppenheimer personally, but he felt compelled to organize a petition in 1954 against Oppenheimer's revoked security clearance.



Fred Ribe holds the transcripts from J. Robert Oppenheimer's 1954 security hearing during Ribe's 2008 presentation on the hearings and his petition at Los Alamos.

Ribe

Meanwhile, Ribe rose to the rank of Group Leader and later Division Leader for the Lab's Controlled Thermonuclear Research Division. In 1977, he became a professor of nuclear engineering at the University of Washington.

Ribe returned to the Lab in 2008 to deliver a presentation on the AEC security hearing and the petition. By the time he died in June 2019, he'd written over 70 papers, garnered numerous awards, and was considered "a leading pioneer in U.S. fusion research," according to his obituary, which also mentioned his 1954 petition drive.

Oppenheimer

Oppenheimer's political career ended abruptly. In response to the AEC verdict, he said, "Our country is fortunate in its scientists, in their high skill, and their devotion. I know that they will work faithfully to preserve and strengthen this country."

In December 2022, after decades of lobbying by the scientific community and mere months before the Laboratory's 80th anniversary, the DOE issued an order officially vacating the Atomic Energy Commission decision in the matter of the revocation of J. Robert Oppenheimer's clearance.

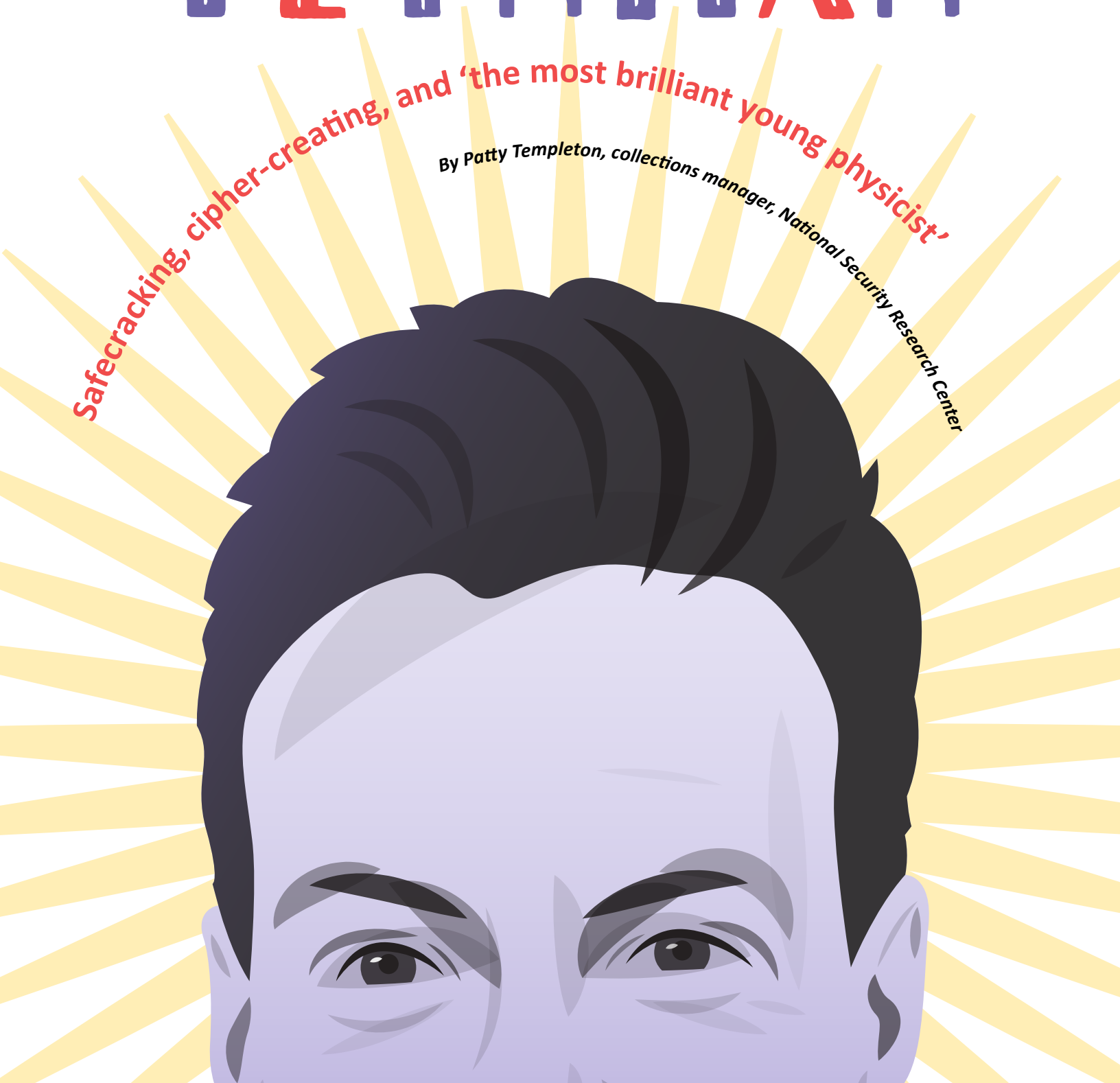
Secretary of Energy Jennifer Granholm stated that, "As time has passed, more evidence has come to light of the bias and unfairness of the process that Dr. Oppenheimer was subjected to while the evidence of his loyalty and love of country have only been further affirmed."

Although Oppenheimer will never know about the rescinding of this decision, after 68 years, the DOE has, as Granholm stated, corrected the historical record. Ribe would very likely agree.

RICHARD FEYNMAN

Safecracking, cipher-creating, and 'the most brilliant young physicist'

By Patty Templeton, collections manager, National Security Research Center



Richard Feynman was fresh out of Princeton University's doctoral program when he was recruited to assist in the creation of the atomic bomb at Los Alamos. In 1943, Lab Director J. Robert Oppenheimer wrote that the 24-year-old was "by all odds the most brilliant young physicist here, and everyone knows this."

The Nobel Prize–winning scientist attempted to live and examine life in a state of play.

Manhattan Project colleague Philip Morrison said Feynman had "the flowing, expressive postures of a dancer, the quick speech we thought of as Broadway, the pat phrases of the hustler, and the conversational energy of a finger snapper." He arrived at the lab as a mischievous whirlwind willing to arrange his absent wife's nightgown on a male dormitory bunk bed and her powder on the bathroom floor to avoid being assigned a roommate.

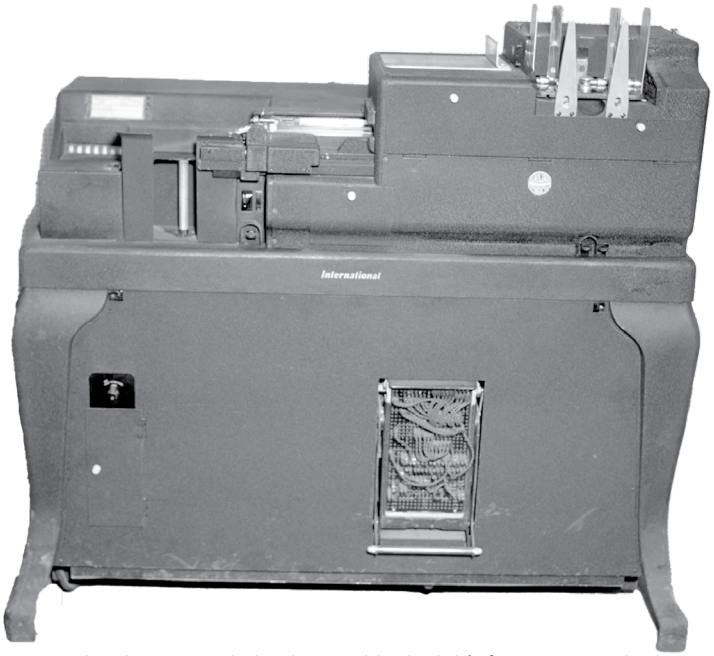
Hans Bethe, Feynman's Theoretical Division boss, became known as The Battleship, with Feynman nicknamed The Mosquito, reflecting how Bethe would plow steadfastly ahead while Feynman paced and yelled, "That's nuts!" Biographer James Gleick stated that Feynman "was just what Bethe was looking for, someone who would perform the severest and most imaginative criticism, who would find flaws before an idea went too far."

This ingenuity extended into the early computational work done at the lab. When a collection of IBM Punched-Card Accounting Machines (PCAMs) arrived, Feynman and his colleagues assembled them using only a set of wiring blueprints, unwilling to wait for the technician to arrive. Gleick wrote that he "could program them to clatter out the cadence of well-known songs"—that is, in addition to refining implosion-simulation calculations from three months each down to less than three weeks.

Coded messages, safe cracking

Always in a wrinkled white shirt and brown wool pants rolled up over work shoes, Feynman was often found banging his drum in the woods and infuriating the military censors that monitored Los Alamos mail for sensitive disclosures. Feynman's wife, Arline, and his father both wrote him coded messages, and eventually agreed to include a key with their correspondence. Feynman later wrote in *Surely You're Joking, Mr. Feynman!*, "As a result of all these experiences with the censor, I knew exactly what could get through and what could not get through. Nobody else knew as well as I. And so I made a little money out of all of this by making bets."

Richard Feynman's lab badge photo is part of the collections in the National Security Research Center. Physicist Murray Gell-Mann said Feynman worked, "with a zest and humor. When we were discussing physics, we could exchange ideas and silly jokes in between bouts of mathematical calculation—we struck sparks off each other, and it was exhilarating."



Richard Feynman helped assemble the lab's first IBM punched-card machines. NSRC historian Nic Lewis explains, "The 601 Multiplying Punch [pictured here in December 1945] was the heart of the Los Alamos punched-card operation, performing the bulk of the calculations for the implosion weapon. The mathematician Naomi Livesay programmed the machines and led their operators, who were mostly members of the Army's Special Engineer Detachment (SED)."

Hans Bethe, shown here in his lab badge photo, worked with Richard Feynman at various times in his early career. In Most of the Good Stuff*, Bethe recalled working as a consultant with Feynman after the war but before his professorship began at Cornell in 1947. "During this time, he [Feynman] was called for a physical examination with the purpose of drafting him into the Army. In a hilarious session, the psychiatrist of the examination board declared him unfit. When he came back to General Electric and told me the details, he and I laughed uproariously for half an hour."*

Los Alamos post office, pictured here not long after World War II ended. In Surely You're Joking, Mr. Feynman!*, Richard Feynman noted that his wife mailed him an advertisement. "It said, 'Send your boyfriend a letter on a jigsaw puzzle. We sell you the blank, you write the letter on it, take it all apart, put it in a little sack, and mail it.' I received that one with a [censor's] note saying, 'We do not have time to play games. Please instruct your wife to confine herself to ordinary letters.'"*

Feynman became known as the lab's premier safecracker by tinkering with office safes and locks on filing cabinets. He wrote to Arline in April 1945, "The key to my interest in all this is probably because I like puzzles so much. Each lock is just like a puzzle you have to open without forcing it."

Feynman was also known for off-duty theatrics and "had no difficulty learning to make an impromptu xylophone by filling water glasses; nor had he any shyness about playing them all evening, at a dinner party for an astonished [Nobel laureate] Niels Bohr," Gleick wrote.

Feynman stated that during Sunday canyon walks with his colleagues, "It was [mathematician John] von Neumann who put the seed in that grew into my active irresponsibility . . . I have no responsibility to be like [people] expect me to be. It's their mistake, not my failing." This vigorous self-discovery continued after World War II ended in 1945. Feynman left Los Alamos for a professorship at Cornell University, as did Bethe.

Sadly, another challenge to his self-discovery would occur. His wife, Arline, passed away in mid-1945. In a posthumous letter to her, he wrote: "Please excuse my not mailing this — but I don't know your new address" (see page 9).

After Los Alamos

No matter a person's *joie de vivre*, if you work overtime for years on one of the most complex scientific endeavors in history and you become a widower during it, burnout can strike. Feynman realized he needed to revitalize his sense of wonder.

In *Surely You're Joking, Mr. Feynman!*, he reflected, "I used to do whatever I felt like doing—it didn't have to do with whether it was important for the development of nuclear physics, but whether it was interesting and amusing for me to play with."

While a professor at Cornell University, Feynman saw a student throw a plate in the air in the cafeteria. He calculated the physics associated with its spin and told Bethe about it. Bethe asked about its importance, and Feynman replied, "There's no importance whatsoever. I'm just doing it for the fun of it."

However, these calculations would prove quite important: "The diagrams and the whole business that I got the Nobel Prize for," Feynman wrote, "came from that piddling around with the wobbling plate."

ON THE SHOULDERS OF GIANTS

HONORING THE VETERANS OF LOS ALAMOS

nsrc.lanl.gov

General Leslie Groves led the Manhattan Project, the U.S. government's top-secret effort to create atomic weapons during World War II. Known as brusque and driven, Groves was just one of hundreds of military members who helped ensure the project's wartime success. At Los Alamos, military members included future Lab Director Norris Bradbury, a naval reserve commander; Army engineer Val Fitch, who was later awarded a Nobel Prize in Physics; William "Deak" Parsons, a naval officer and an ordnance expert; and Army officer Miriam White Campbell, who drew the designs for the Little Boy weapon.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

GENERAL LESLIE R. GROVES

A LIFETIME OF CONSTRUCTION AND SERVICE

By Renae Mitchell, communications specialist, National Security Research Center

Gen. Leslie Groves's badge photo from the Manhattan Project–era lab in Los Alamos. His and other badge photos are part of the collections of the Lab's National Security Research Center.

From his early Army years at West Point to his leadership of the Manhattan Project, Gen. Leslie R. Groves is remembered for a lifetime of extraordinary military service.

"I believe that Los Alamos exists because of Groves," said Lab historian Roger Meade. "He hired directors [J. Robert] Oppenheimer, who created and built the wartime lab, and [Norris] Bradbury, who kept the lab relevant after the end of the war and laid the foundation for its permanence."

Early military influence

Military leadership seemed to be in Groves's blood and his destiny. In 1896, the year Groves was born, his father transitioned from a full-time Presbyterian pastor to a

military chaplain. Growing up on military installations and witnessing his father's dedicated service were influential on Groves's educational and professional decisions.

In his book *Now It Can Be Told: The Story of the Manhattan Project* (1962), Groves reflected on how he "came to know many of the old soldiers and scouts who had devoted their active lives to winning the West," whose stories left him "somewhat dismayed, wondering what was left for me to do now that the West was won." However, after World War I, Groves's life path became clear.

Starting a military career

At the U.S. military academy West Point, Groves's education was fast-tracked through a War Emergency Course because of the United States' entry into World War I. He later graduated from the Army Engineer School, Command and General Staff School, and Army War College.

After serving on several military bases at home and abroad, Groves joined the War Department General Staff in Washington, DC, to direct the location and construction of a site for training and mobilizing Army personnel. He then led the construction of the world's largest office building at the time: the headquarters for the U.S. Department of Defense and a symbol of the military, what would come to be known as the Pentagon. Construction of the Pentagon began in 1941 and was completed in 1943. These large planning and construction projects helped prepare him for what would be the biggest project of his life.

Leading the Manhattan Project

The Manhattan Project had begun in August 1942, but many of those involved found progress too slow and inefficient for such an urgent objective—the development and production of the world's first atomic bomb. The project needed someone who would shepherd its construction and advancement more aggressively, and the name that came up in discussions was Leslie Groves.

The pace that Groves set for the construction of the Los Alamos wartime lab was ambitious indeed, and this efficiency earned him the reputation of having "no time for the subtleties of diplomacy . . . By temperament and training, he was an authoritarian," according to *American Prometheus*, which also noted that Groves's aide Col. Kenneth D. Nichols said, "He has the guts to make timely, difficult decisions . . . I hated his guts and so did everybody else, but we had our form of understanding."

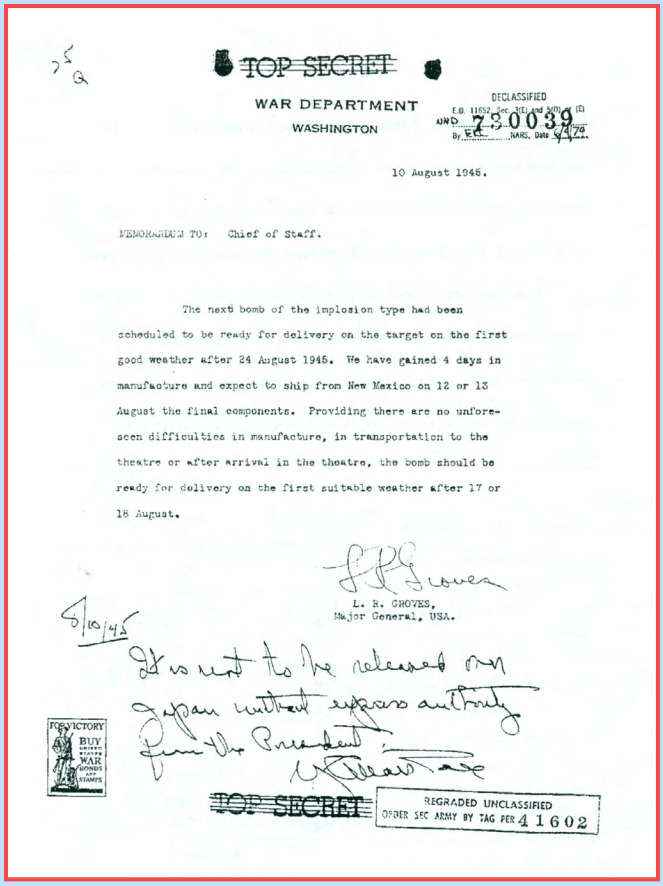
Choosing Oppie and Los Alamos

Groves needed a scientist with a breadth of physics knowledge, rather than a specialization, to oversee the scientific administration of the laboratory. Groves chose

He then led the construction of the world's largest office building at the time: the headquarters for the U.S. Department of Defense and a symbol of the military, what would come to be known as the Pentagon.

Gen. Leslie Groves was the leader of the Manhattan Project, the U.S. government's top-secret effort to build atomic weapons during World War II. Among other decisions, Groves helped select Los Alamos as the site for the clandestine lab and hired physicist J. Robert Oppenheimer as its first director.

Gen. Leslie Groves studies a map of the Pacific, where fighting continued against the Japanese as Los Alamos scientists worked to create the first atomic bombs and end World War II.



~~TOP SECRET~~

WAR DEPARTMENT
WASHINGTON

DECLASSIFIED E.O. 11652 sec. 3(E) and NND 736039 By NARS, Date 4-4-75

10 August 1945.

MEMORANDUM TO: Chief of Staff.

The next bomb of the implosion type had been scheduled to be ready for delivery on the target on the first good weather after 24 August 1945. We have gained 4 days in manufacture and expect to ship from New Mexico on 12 or 13 August the final components. Providing there are no unforeseen difficulties in manufacture, in transportation to the theatre or after arrival in the theatre, the bomb should be ready for delivery on the first suitable weather after 17 or 18 August.

L. R. GROVES,
Major General, USA.

8/10/45
It is not to be released over Japan without express authority from the President
W. Leahy

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

~~TOP SECRET~~

REGRADED UNCLASSIFIED
ORDER SEC ARMY BY TAG PER 41602

This memo from Gen. Leslie Groves to the chief of staff details the availability of a third weapon, following the U.S. bombings of Hiroshima and Nagasaki. However, Japan surrendered unconditionally and no other bombs were deployed.

physicist J. Robert Oppenheimer despite opposition from the Manhattan Engineer District (MED) and Military Policy Commission, which expressed numerous concerns over Oppenheimer's past associations with friends and family members who had ties to the communist party. Additionally, as Groves states in his book, "Oppenheimer had two major disadvantages—he had had almost no administrative experience of any kind, and he was not a Nobel Prize winner."

Groves was certain of his choice, though, and issued the following letter: "In accordance with my verbal directions . . . it is desired that clearance be issued for the employment of Julius Robert Oppenheimer without delay, irrespective of the information which you have concerning Mr. Oppenheimer. He is absolutely essential to the project."

Groves's instincts were correct. Oppenheimer's role became one of many decisions Groves made that proved instrumental to the Manhattan Project's success. Another was choosing the site of Los Alamos.

Groves drew on his experience in construction and site preparation to make the critical decision of where the secret scientific laboratory, called Project Y, would be located. After discussions with Oppenheimer, Groves sought a location that was isolated enough for scientists to collaborate freely but could support the construction of critical research and development facilities. With agreement from the search committee, Groves settled on a rural area in the northern New Mexico mountains, inhabited by a few homesteaders and a boys' boarding school.

Deploying the atomic bombs

Once the bombs had been successfully developed, there was another critical decision to make. Groves consulted with members of the U.S. administration and a Target Committee, which included other members of the Manhattan Project, to discuss the where, when, and why of potential locations to drop the bombs and end the war. Groves never wavered from this objective, recalling in his book, "In such a climate, no one who held a position of responsibility in the Manhattan Project could doubt that we were trying to perfect a weapon that, however repugnant it might be to us as human beings, could nonetheless save untold numbers of American lives."

Five sites were chosen within Japan, to be bombed consecutively until a declaration of peace could be made. "I had set as the governing factor that the targets chosen should be places the bombing of which would most adversely affect the will of the Japanese people to continue the war," Groves wrote. "Beyond that, they should be military in nature." Once Hiroshima and then Nagasaki had been bombed, the U.S. military began preparations for a

Seated, from left: *second Lab Director Norris Bradbury; Gen. Leslie Groves; and Eric Jette, division leader for Chemistry and Metallurgy.*

third site. However, the emperor of Japan agreed to a peace treaty before the third bomb could be delivered.

With the official end of World War II on September 2, 1945, Groves received numerous awards and commendations, including the Distinguished Service Medal, Commander of the Order of the Crown from Belgium, and Companion of the Order of the Bath from Britain. These awards recognized Groves's accomplishments as well as the military allied relationship between the United States and other countries.

After the Manhattan Project

Groves relinquished responsibility for the MED and Los Alamos in 1947. He went on to pursue a civilian career but maintained ties with the military. He was promoted in retirement to lieutenant general and served as president of the West Point alumni organization, among other distinctions.

Groves died from heart disease at the age of 73 and is interred at Arlington National Cemetery.

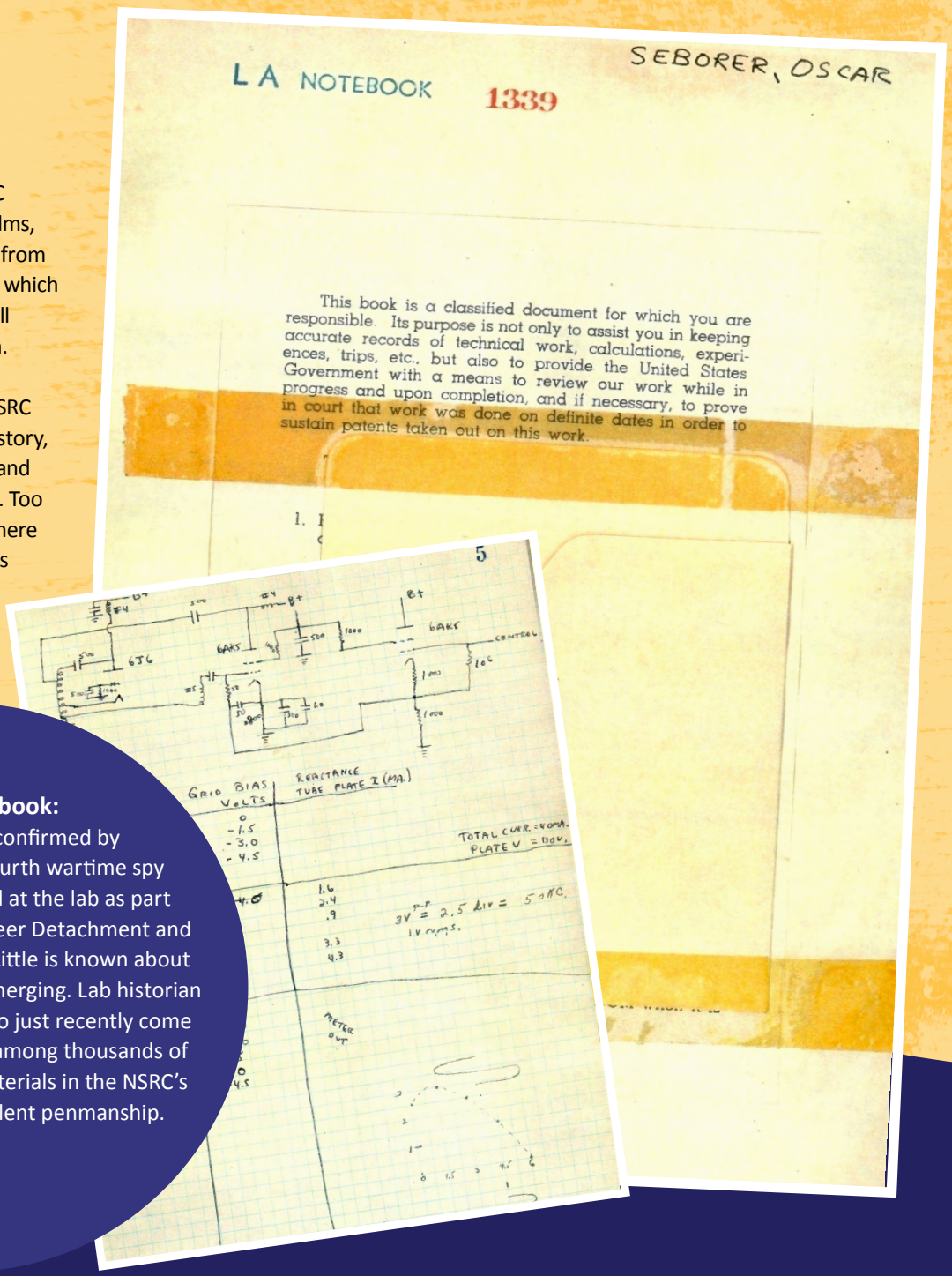
"Oppenheimer had told me that he wanted to leave [the Los Alamos lab] as soon as he could [after the war ended], and we discussed a possible successor for him," writes Groves in Now it Can Be Told. *"After much thought and considerable discussion with Oppenheimer and others I asked Dr. Norris Bradbury [pictured here talking with Groves] to take the position. Bradbury had . . . played an important part in the development of the gun-type bomb. Also, he was a Navy reserve officer, a circumstance I thought would help him in maintaining smooth relations between the civilian scientific staff and the military administrative officers."*

Known as an unlikely pair, J. Robert Oppenheimer and Gen. Leslie Groves formed a successful partnership based in mutual respect. The two stand in perpetual conversation in this memorial located in downtown Los Alamos.

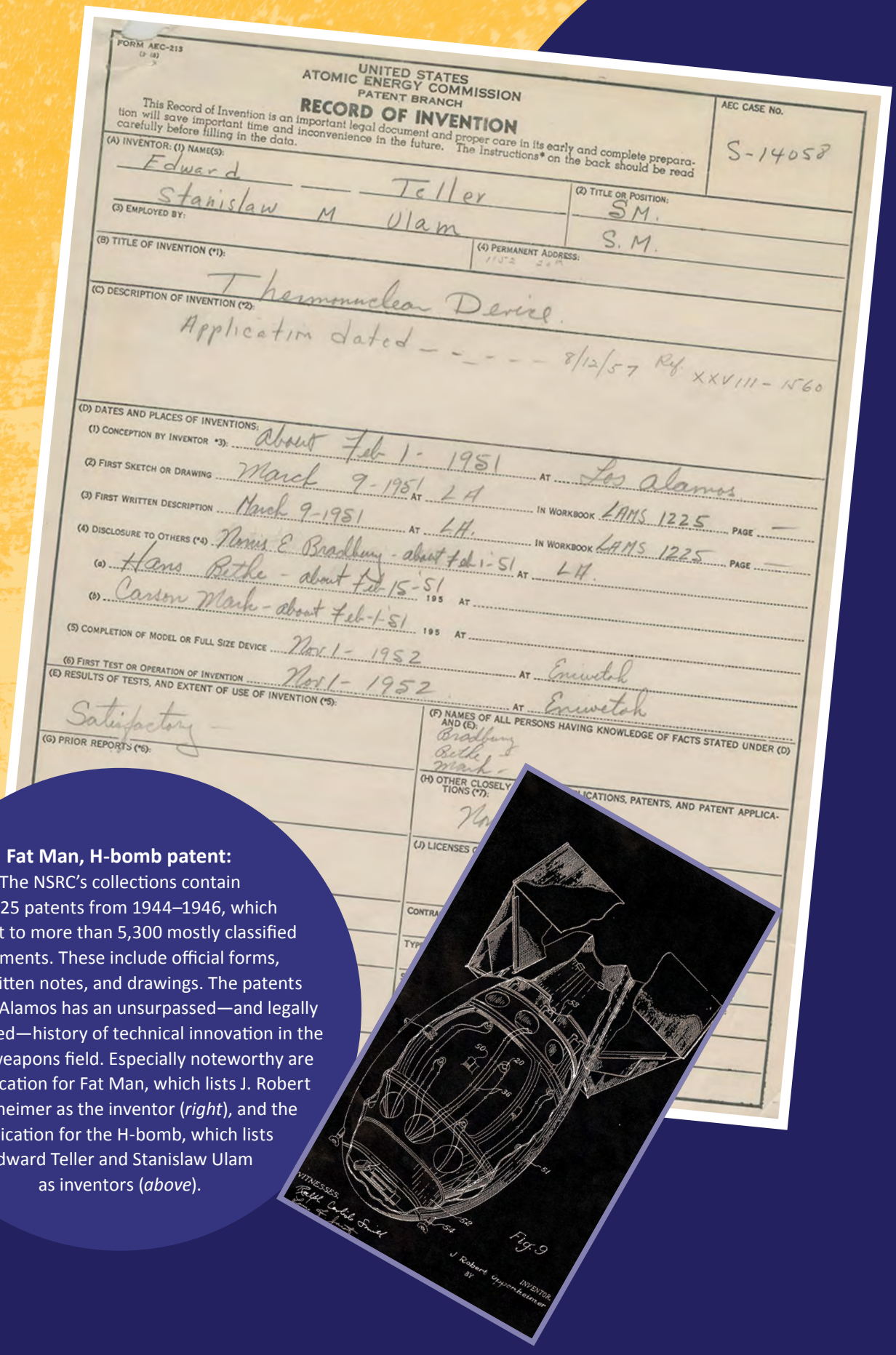
Voyage of DISCOVERIES

By National Security Research Center staff

Fascinating finds are down every aisle and around every corner of the Laboratory's classified library, today called the National Security Research Center (NSRC). The NSRC preserves classified documents, films, photographs, and other materials from history's greatest scientific minds, which today's researchers rely on to fulfill the Lab's national security mission. Meanwhile, the unclassified relics that are often discovered in the NSRC archives preserve the Lab's rich history, which dates back to World War II and the start of the nuclear enterprise. Too numerous to list in their entirety, here are just a few of the historical finds preserved by the NSRC.



A spy's notebook:
Oscar Seborer was confirmed by historians in 2019 as a fourth wartime spy at Los Alamos. He worked at the lab as part of the Army's Special Engineer Detachment and witnessed the Trinity test. Little is known about Seborer, though clues are emerging. Lab historian Ellen McGehee happened to just recently come across the spy's notebook among thousands of Manhattan Project–era materials in the NSRC's collections. He had excellent penmanship.



FORM AEC-213

UNITED STATES
ATOMIC ENERGY COMMISSION
PATENT BRANCH

RECORD OF INVENTION

This Record of Invention is an important legal document and proper care in its early and complete preparation will save important time and inconvenience in the future. The instructions* on the back should be read carefully before filling in the data.

AEC CASE NO. S-14058

(A) INVENTOR: (1) NAME(S): Edward Teller; Stanislaw M Ulam

(2) TITLE OR POSITION: S.M.; S. M.

(3) EMPLOYED BY:

(4) PERMANENT ADDRESS:

(B) TITLE OF INVENTION (*1): Thermonuclear Device.

(C) DESCRIPTION OF INVENTION (*2): Application dated 8/12/57 Ref. XXVIII-1560

(D) DATES AND PLACES OF INVENTIONS:

(1) CONCEPTION BY INVENTOR *3): about Feb 1 1951 AT Los Alamos

(2) FIRST SKETCH OR DRAWING March 9-1951 AT LA IN WORKBOOK LAMS 1225 PAGE —

(3) FIRST WRITTEN DESCRIPTION March 9-1951 AT LA. IN WORKBOOK LAMS 1225 PAGE —

(4) DISCLOSURE TO OTHERS (*4) Nicus E Bradbury - about Feb 1-51 AT LA.

(a) Hans Bethe - about Feb 15-51

(b) Carson Mark - about Feb-1-51 195 AT

(5) COMPLETION OF MODEL OR FULL SIZE DEVICE Nov 1- 1952 AT Eniwetok

(6) FIRST TEST OR OPERATION OF INVENTION Nov 1- 1952 AT Eniwetok

(E) RESULTS OF TESTS, AND EXTENT OF USE OF INVENTION (*5): Satisfactory

(F) NAMES OF ALL PERSONS HAVING KNOWLEDGE OF FACTS STATED UNDER (D) AND (E): Bradbury Bethe Mark

(G) PRIOR REPORTS (*6):

(H) OTHER CLOSELY ... TIONS (*7): ...ICATIONS, PATENTS, AND PATENT APPLICA-

(J) LICENSES ...

CONTRA...

TYP...

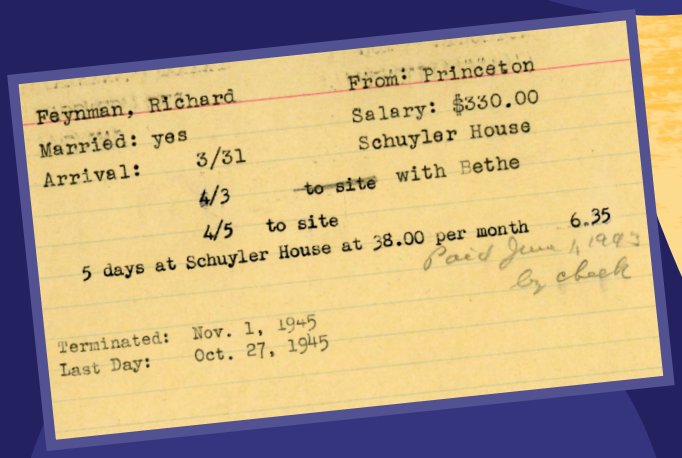
WITNESSES: Ralph Carlisle Smith

Fig. 9

J Robert Oppenheimer BY INVENTOR

Fat Man, H-bomb patent:
The NSRC's collections contain over 25 patents from 1944–1946, which amount to more than 5,300 mostly classified documents. These include official forms, handwritten notes, and drawings. The patents show Los Alamos has an unsurpassed—and legally documented—history of technical innovation in the nuclear weapons field. Especially noteworthy are the application for Fat Man, which lists J. Robert Oppenheimer as the inventor (*right*), and the application for the H-bomb, which lists Edward Teller and Stanislaw Ulam as inventors (*above*).

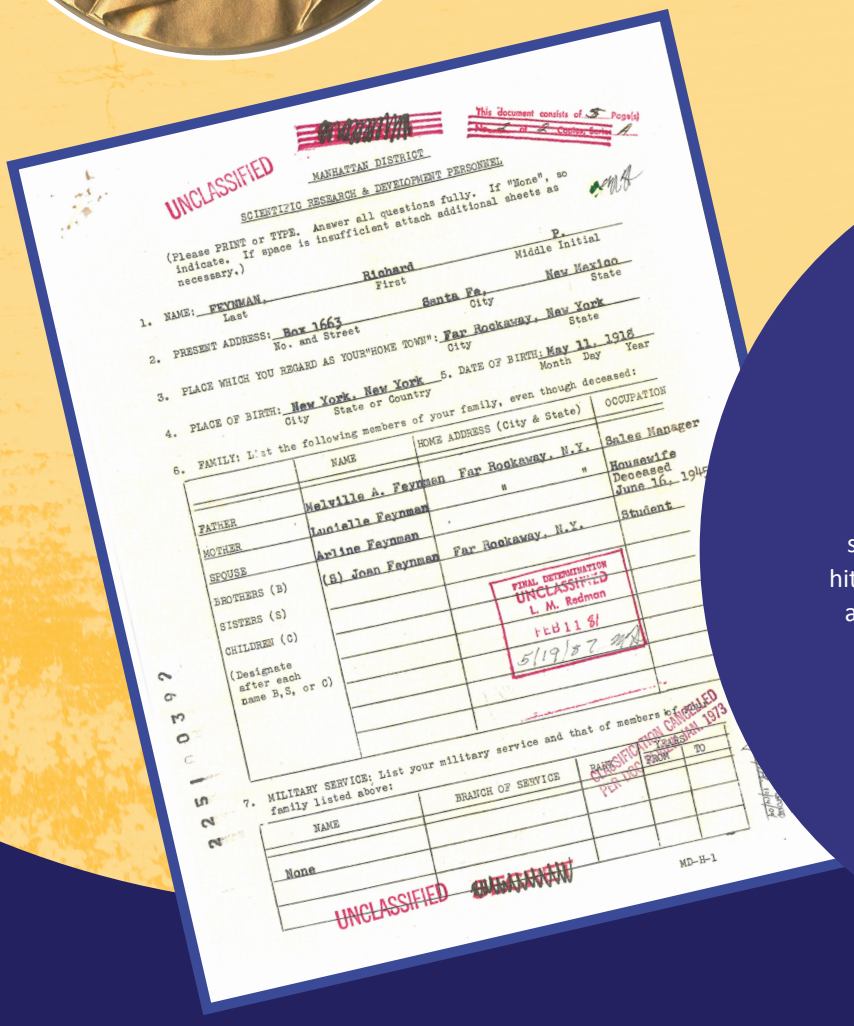
Richard Feynman's personnel records:
A fellow physicist described Richard Feynman as "the most original theoretical physicist of our time" who also "liked colorful language and jokes." Known as a prankster, a comedian, and a genius in the truest sense of the word, Feynman is one of the Lab's most famous and beloved wartime scientists.


Feynman, Richard
Married: yes
Arrival: 3/31
From: Princeton
Salary: $330.00
Schuyler House
4/3 ~~to site~~ with Bethe
4/5 to site
5 days at Schuyler House at 38.00 per month 6.35
Paid June 1, 1943
By check
Terminated: Nov. 1, 1945
Last Day: Oct. 27, 1945

McKibbin card:
One of Director J. Robert Oppenheimer's secretaries, Dorothy McKibbin, created what would become her namesake index card for each wartime lab employee upon arrival. Today, thousands of these cards are preserved in the Lab's historic collections, including Richard Feynman's.

Badge photo:
Sporting a wrinkled white shirt and brown wool pants rolled up over work shoes, Feynman could often be found banging his drum in the woods or cracking codes on office safes and filing cabinets.

Nobel Prize medal official replica:
Of all the Nobel Prize winners connected to Los Alamos National Laboratory, just one earned the coveted accolade for work conducted while at the Lab. Frederick Reines was awarded the Nobel Prize in Physics in 1995 for the detection of the neutrino. Laureates can order up to three replicas of their Nobel medal; one of Reines's replica medals is part of the NSRC's historical collections.



Manhattan District form:
Twenty-four years old and newlywed, Feynman arrived in New Mexico with his wife Arline, who stayed in an Albuquerque hospital, suffering from tuberculosis. He borrowed cars and hitchhiked to visit her when he wasn't working on the atomic bomb. He was by her side when she passed away in June 1945.

30th ANNIVERSARY OF DIVIDER

Unique artifacts commemorate anniversary of last nuclear test

By Brye Steeves, director, National Security Research Center

It's a blast from the past in more ways than one.

As part of a temporary display in the Los Alamos National Lab headquarters building, staff had the opportunity to see legacy items—photos, maps, documents, clothing, and a test rack replica—from the Lab's weapons testing era.

The display, curated by the National Security Research Center (NSRC), commemorated Divider, which was the nation's last nuclear test prior to the 1992 moratorium on explosive testing. It was conducted on September 23, 1992, at the Nevada Test Site (now the Nevada National Security Site, or NNSS). Like The Gadget at the Trinity test, which was the world's first successful detonation of a nuclear device, the Divider test device was a Los Alamos–designed weapon. This was the nation's 1,054th nuclear test over a 47-year period.

"The items on display are unclassified, but are either housed in a library where browsing is regulated or are personal items that belong to retired weapons scientists," said Laura McGuiness, a librarian with the NSRC, the Lab's classified library. "So, this is a chance for Lab staff to freely view a few unique artifacts during a milestone anniversary for the Lab's weapons history."

McGuiness led the effort to research and select from the thousands of Divider-related materials in the NSRC's collections, which include both classified materials and unclassified historical items.

"I wanted the artifacts displayed to showcase the amount of effort expended to ensure the success of a nuclear test," McGuiness said. "My favorite item is the Divider participant roster, precisely because it revealed the extraordinary level of teamwork required."

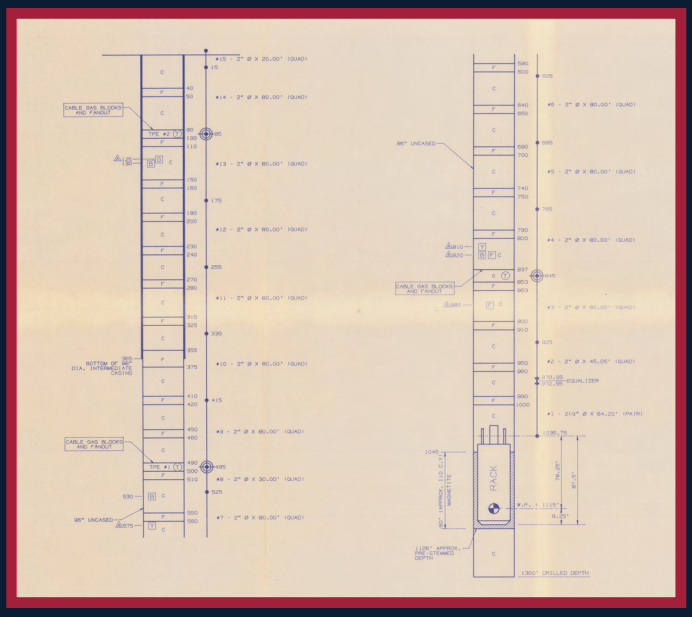
Here are a few highlights from the Divider 30th Anniversary display:

Test logos

All 1,054 U.S. nuclear tests have unique names. Tests were named after birds, colors, games, trees, and even cities in Texas. By the 1960s, logos featuring test names appeared as stickers, patches, and artwork on test towers. The logo for Divider was created by Ward Zaelke and features a caricature of the draftsman Larry Smith holding a divider—a common drawing tool.

Photos, drawings

Dozens of pre-test preparation photos from 1992 and present-day images of the Divider crater were displayed alongside engineering drawings of the test rack and its components.



Diagnostic drawing of Icecap test rack and tower, illustrating tower height and drill depth.

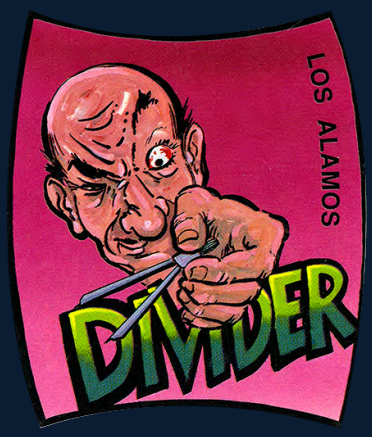
The Divider test rack during setup at the Nevada Test Site (now the Nevada National Security Site).

Test rack replica

Before completion of the Divider test, preparations had already begun for the next test, Icecap, including construction of its test rack and tower. However, just days after Divider, a nuclear testing moratorium went into effect and Icecap was canceled. The 152-foot rack and tower are still in place at the NNSS today, and a miniature replica of the Icecap tower was included in the anniversary display.

Maps

Several key maps were on display, including one that shows the locations of the nuclear tests—including Divider—conducted at the NNSS. At approximately 1,355 square miles, the test site is larger than Rhode Island.



ARMANDO

AUSTIN

BAR

BAROLO

BEXAR

BOWIE

CIMARRON

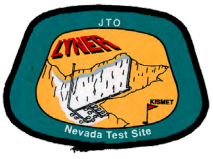
CYBAR

DIVIDER

ICE CAP

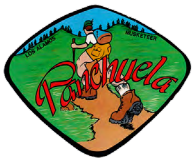
KEARSARGE

LEDOUX



LYNER

MILAGRO



PANCHUELA

REBOUND

STAGECOACH

STALLION

TAHOKA

THOROUGHBRED

TULIA

30th ANNIVERSARY OF DIVIDER

nsrc.lanl.gov

All 1,054 U.S. nuclear tests have unique names. Tests were named after birds, colors, games, trees, and even cities in Texas, among other categories. By the 1960s, logos featuring the names appeared as stickers, patches, and artwork on test towers. The logo for Divider features a caricature of the draftsman Larry Smith holding a divider—a common drawing tool. Divider, the nation's last full-scale nuclear test, was conducted on September 23, 1992, at the Nevada Test Site (now the Nevada National Security Site), marking the pivot to stockpile stewardship.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

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The images of the 2023 Vault team featured here echo the noir graphic novel style of this issue's feature story, "Those Who Believed in Oppenheimer," centered on the Atomic Energy Commission's decision—and junior Lab physicist Paul L. Ribe's petition protesting it, signed by hundreds of Los Alamos scientists—to revoke first Lab Director J. Robert Oppenheimer's security clearance in June 1954.

LA-UR-23-28706