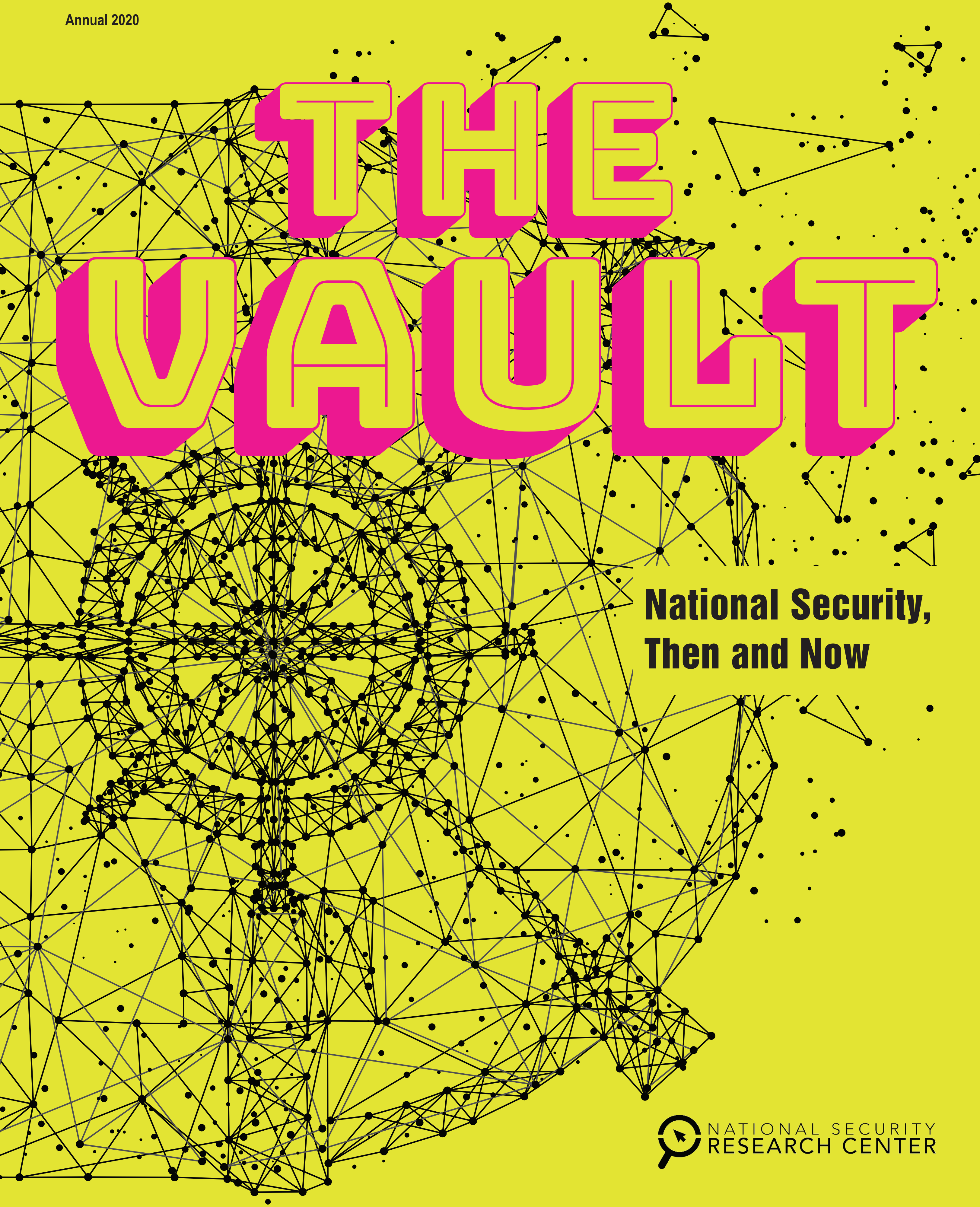
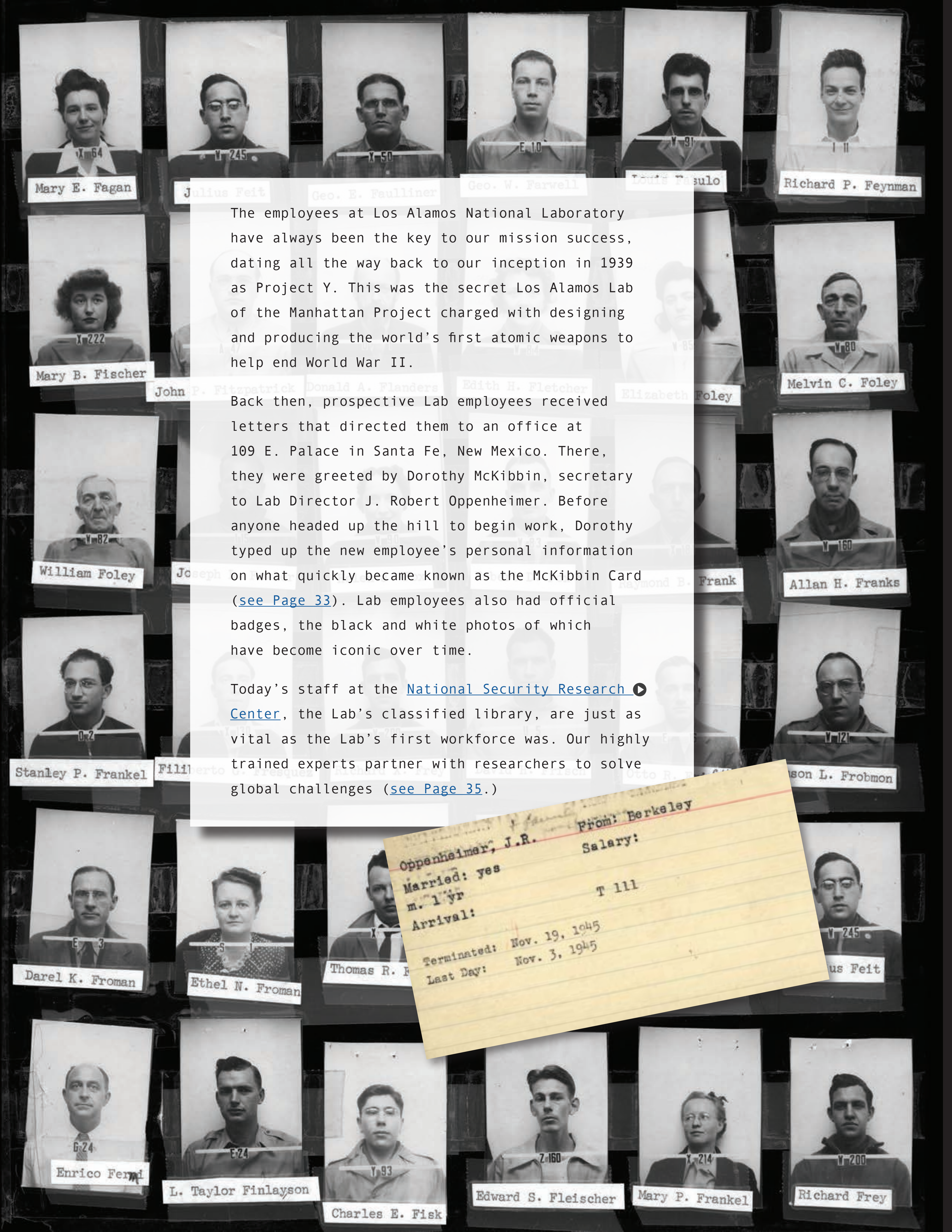
Annual 2020

THE VAULT



National Security, Then and Now

NATIONAL SECURITY
RESEARCH CENTER



The employees at Los Alamos National Laboratory have always been the key to our mission success, dating all the way back to our inception in 1939 as Project Y. This was the secret Los Alamos Lab of the Manhattan Project charged with designing and producing the world's first atomic weapons to help end World War II.

Back then, prospective Lab employees received letters that directed them to an office at 109 E. Palace in Santa Fe, New Mexico. There, they were greeted by Dorothy McKibbin, secretary to Lab Director J. Robert Oppenheimer. Before anyone headed up the hill to begin work, Dorothy typed up the new employee's personal information on what quickly became known as the McKibbin Card (see Page 33). Lab employees also had official badges, the black and white photos of which have become iconic over time.

Today's staff at the National Security Research Center, the Lab's classified library, are just as vital as the Lab's first workforce was. Our highly trained experts partner with researchers to solve global challenges (see Page 35.)

Oppenheimer, J.R. From: Berkeley
Married: yes Salary:
m. 1 yr
Arrival: T 111
Terminated: Nov. 19, 1945
Last Day: Nov. 3, 1945

NSRC DIRECTOR'S WELCOME LETTER

Have you ever known exactly what someone was thinking? I have.

At the National Security Research Center, there are quite literally millions of materials that date back to the 1940s, from the start of the nuclear enterprise to today, including the handwritten notebooks of a dozen Nobel laureates who worked at Los Alamos National Laboratory.

Thanks to these notebooks, it's possible to unequivocally read the thoughts of some of the greatest minds in history as they tackled the scientific and engineering challenges related to our national security. And, I have to say, they were indeed brilliant.

These notebooks are just one small part of the NSRC's collections. I have perused the various collections countless times, each new discovery just as fascinating as the next.

The NSRC is LANL's classified library and a major research center where our scientists, engineers, and researchers find the information they need to help secure our nation.

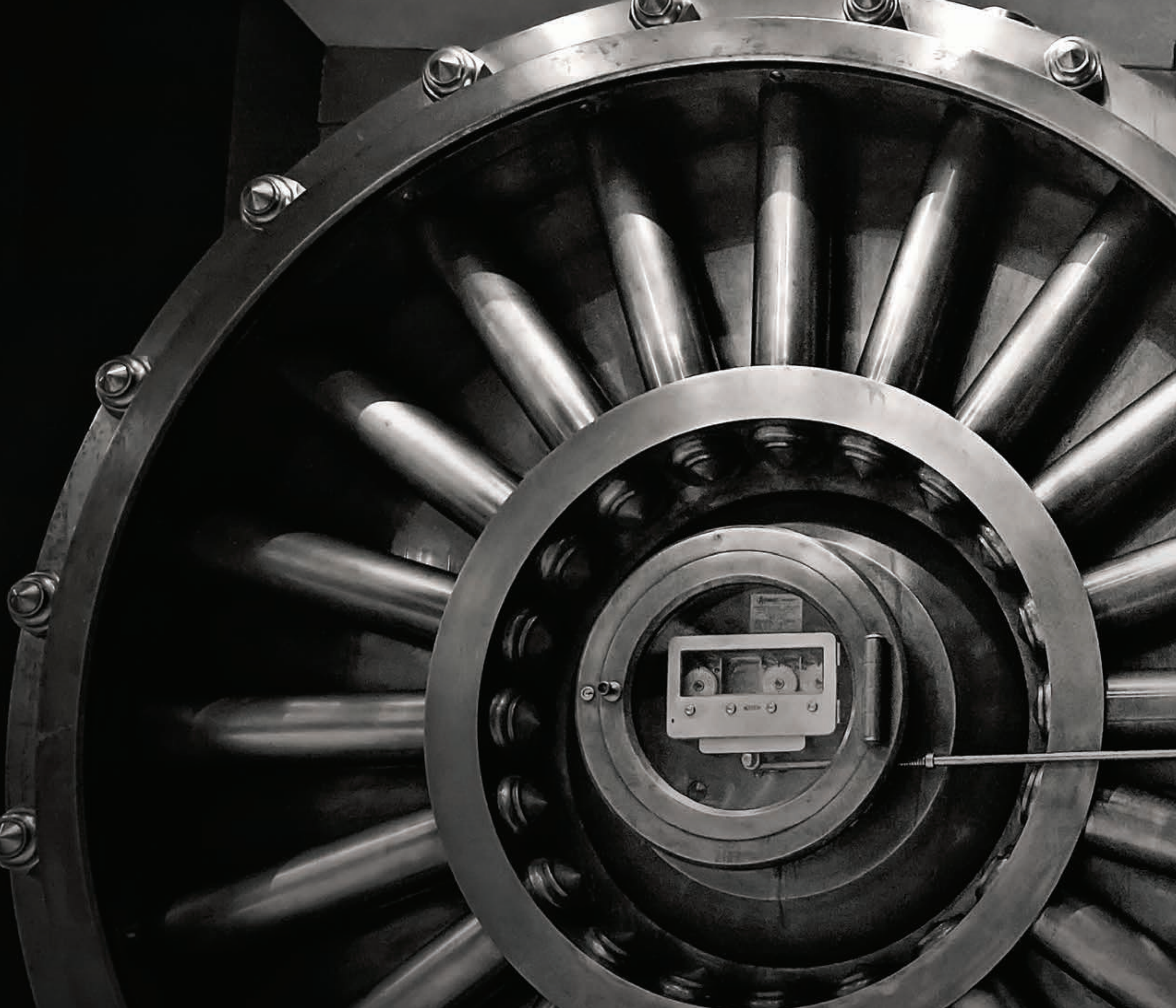
We're celebrating our first anniversary this summer. After opening our doors in June 2019, the Center had a truly extraordinary year. Our overall focus this first year was to transform a stagnant archive into a dynamic, thriving research library with expert staff. Thanks to the NSRC's dedicated teams, our accomplishments are too numerous to list, but include

- *The digitization of the entire physical card catalog (hundreds of thousands of cards), making it accessible online to researchers.*
- *The implementiation of a process to exchange documents with Lawrence Livermore National Laboratory's archives.*
- *The increase in partnerships among LANL's divisions, reaching new groups of scientists, engineers, and researchers.*
- *The creation of six new digitization labs to increase productivity, while preserving one-of-a-kind media that is rapidly deteriorating.*
- *The implementation of certification and continuing professional education programs that signify the NSRC staff meet the highest levels of expertise in their fields.*

I couldn't be more proud of our opening year, and I am honored to be the first director of this remarkable national research facility.

Rizwan Ali

Director, National Security Research Center



5 **Classified Library**
The Lab's National Security Research Center is a dynamic facility accessed by the nation's top scientists and engineers as they solve global challenges.

13 **The Road to Trinity**
One of history's greatest scientific breakthroughs was achieved in the New Mexico desert on July 16, 1945, helping to end World War II just weeks later.

21 **Voyage of Discoveries**
Handwritten notebooks from scientific geniuses. Blueprints of the world's first atomic weapons. Fascinating finds fill the National Security Research Center.

23 **The story of Oscar Seborer, Atomic Spy**
A fourth World War II–era spy at Los Alamos was recently confirmed by historians just months ago.

27 **State-of-the-art Digitizing Facilities**
Expert staff and high-tech equipment in six labs at the National Security Research Center preserve materials dating back to the beginning of the nuclear enterprise.

33 **Dorothy McKibbin: The Gatekeeper**
She was hired as the secretary to the Lab's first director, J. Robert Oppenheimer, but Dorothy McKibbin was much more.

LOS ALAMOS NATIONAL LABORATORY

CLASSIFIED LIBRARY

The National Security Research Center marks its inaugural anniversary this summer, but this first year has actually been nearly eight decades in the making.

The NSRC, which opened its doors on June 10, 2019, is a dynamic research facility that houses the world's most-comprehensive collection of national security and nuclear weapons materials dating back to the Manhattan Project of the 1940s. Located inside the Los Alamos National Laboratory headquarters, the NSRC gives the nation's top scientists, engineers, and researchers access to digital and physical collections on a daily basis as they work to solve global challenges.

"The Lab recognized the vital need for a research center that can make records of the past discoverable for today's research," says Riz Ali, Director of the NSRC. "We now have an exciting, vibrant place where people are tapping into the entire history of the nuclear enterprise. The NSRC's first year has truly been a remarkable one."

COLLECTIONS, EXPERT STAFF, CUTTING-EDGE TECHNOLOGY

The NSRC contains tens of millions of original materials in nearly every format imaginable, including film, photos, engineering drawings, audio tapes, and microfiche, among others. New materials are added daily; electronic collections are available via a searchable database, and physical materials are accessible with staff assistance.

"These records relate to global security and the design and development of nuclear weapons, dating back to the Manhattan Project, when the then-secret Los Alamos Lab designed and produced the world's first atomic weapons," says Alan Carr, LANL's senior historian.

Carr is just one of dozens of experts on the NSRC staff, many of whom offer personalized research assistance and services not unlike those at major research libraries. Other staff use cutting-edge technology to digitize and preserve the collections.

SUPPORTING THE LANL MISSION

"There is often a misconception that these collections are simply legacy material," says Jason Pruet, Director of LANL's Advanced Simulation and Computing Program. "That just isn't true. For many topics, such as for missile defense or strategic stability, the written studies in the Center are as good or better than anything else that has ever been done."

LANL researchers often point out that what makes much of this material so vital is its documentation of nuclear weapons testing the United States no longer conducts. All the records since the 1940s – from the designs to the tests – are in the NSRC. Furthermore, the science from the days of testing is as valid today as it was back then.

"When you see the research from the Lab's earliest scientists, often times in their notebooks or in their memos to each other, you get that same sense of great minds tackling national security problems that still confront us today," says Charlie Nakhleh, Associate Laboratory Director for Weapons Physics.

These collections capture the knowledge from vital points in our nuclear history and make it available for new generations of scientists working to ensure our national security.

"The NSRC is an incredible asset to us," says Frank Gibbs, LANL's Director of Actinide Operations, Weapons Production. "The vast array of documentation that we have access to – the technical reports, the data sources – helps us underpin what we're trying to do in weapons production today. And as we bring on new engineers and scientists at the Lab, the NSRC is our first stop to find out what's been done."

As the NSRC looks beyond its first year, it will continue to grow its programs, expand its collections, and form vital partnerships to meet researchers' needs as well as those of the Lab.

"Executing LANL's mission," Ali says, "starts at the National Security Research Center." ★

WHAT WAS OPPENHEIMER'S FIRST NAME?

By Brye Steeves, National Security Research Center Communications Specialist

He is known as the father of the atomic bomb and was the most famous scientist of his generation.

Still an iconic figure today, Oppenheimer is a household name. But, 53 years since his death on Feb. 18, 1967, we're not completely certain of what exactly the first part of that name is.

J. Robert Oppenheimer was called by his middle name. This is not uncommon, of course, but historical documents and Oppenheimer himself contradict each other on whether his first name was Julius or just a letter J that did not stand for anything.

DISAGREEMENTS

By far, most sources state Oppenheimer's first name was Julius. Numerous others, though, said Oppenheimer always insisted the J didn't stand for anything.

In a 1946 letter to the U.S. patent office, Oppenheimer wrote: "This is to certify that I have no first name other than the letter J, and that my full and correct name is J Robert Oppenheimer."

BIRTH CERTIFICATE

But, according to the Pulitzer Prize-winning biography *American Prometheus*, he was named after his father, and his birth certificate reads: "Julius Robert Oppenheimer." This would be unusual, however, because naming a baby after a living relative is contrary to European Jewish tradition.

In re application of
J Robert Oppenheimer
Improvements in Releasing Nuclear Energy

Hon. Commissioner of Patents
Washington, D. C.

Dear Sir:

This is to certify that I have no first name other than the letter J, and that my full and correct name is J Robert Oppenheimer as given in the above-identified accompanying application for United States Patent.

Respectfully,

J Robert Oppenheimer /s/

J Robert Oppenheimer

In a letter that Oppenheimer wrote to the U.S. patent office in 1946, he states: "I have no first name other than the letter J …" This letter was recently discovered in the Lab's historic collections by staff at the National Security Research Center, the Lab's classified library in the National Security Sciences Building.

OBITUARY

Published in *The New York Times* a day after he died at the age of 62 from throat cancer, his obituary states that the J did not stand for anything.

The obituary goes on to note that Oppenheimer was known for his "charm, eloquence and sharp, subtle humor," in addition to the scientific achievements that secured his place in history.

Whether he was Julius or just the letter J, many remember him by the nickname he earned in his mid-20s that stuck the rest of his life: Oppie. (Though there is disagreement as to whether it was Oppie, Oppy or Opje.) ★

The National Security Research Center's materials are related to the development, testing, and production of nuclear weapons, dating from World War II through today.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

THE HEART OF THE LAB THROUGH THE YEARS

By Madeline Whitacre, National Security Research Center Archivist-Historian

How did we end up in Los Alamos?

During the Manhattan Project, which was initially headquartered in New York, the U.S. government needed a place to build a secret lab to design and produce the world's first atomic weapons.

TA-03 in 1946

TA-03 in 1955

TA-03 in 1982

^ Los Alamos TA-03 today

There were several factors considered when selecting the site. The U.S. Army needed somewhere that was far inland, so a lab wouldn't be vulnerable to sabotage, but was also near a rail line for ease of transportation. It needed to be isolated and easily defensible. Ideally, there would be few residents, so only a minimum number of people would be displaced, and there would be some preexisting buildings that could be put into use immediately. Los Alamos fit these requirements: It is nowhere near a coast, a train ran through the somewhat-nearby town of Lamy, mesas provided natural defense, and a private ranch school for boys and several homesteads housed the only residents in the area. The decision was made, and since 1943, the town and community have been closely linked to the development of the Laboratory.

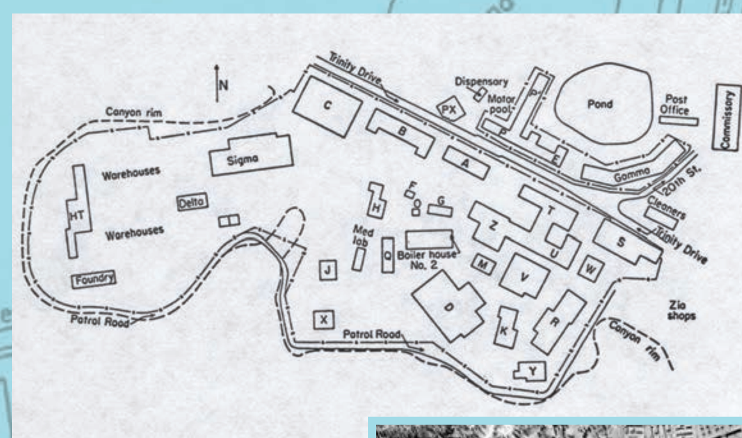
CENTRAL HUB

The Los Alamos Ranch School was located across from Ashley Pond on the main mesa. Buildings from the school provided a good starting place for the project's personnel, so this became the central hub of the Lab. Laboratory buildings were located in a fenced-off area to the southwest of Ashley Pond. These original buildings had been constructed quickly and were meant as temporary structures to last only the duration of World War II.

Once it became clear that the Laboratory would be sticking around after WWII ended, our second director, Norris Bradbury, who succeeded famed scientist J. Robert Oppenheimer, began working to get more permanent facilities built.

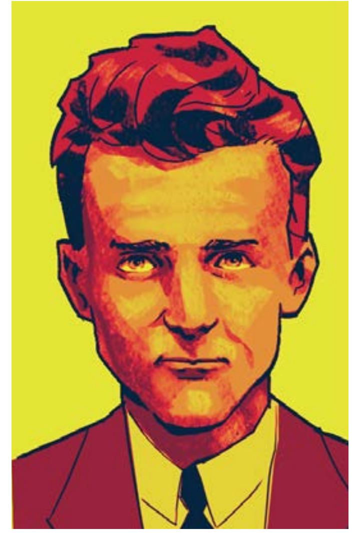
Laboratory leaders decided to move the Lab away from the residential areas in the center of town; the heart of the Laboratory moved to the mesa just south of its original site. Construction of the Administration Building was completed at TA-3 ("TA" stands for Technical Area) in March 1956 and was known as Building SM-43. ("SM" indicated that the buildings were located on the South Mesa rather than in town.) The Ad Building, as it was commonly called, brought the director's office over to TA-3, solidifying the move away from downtown.

Over the years modern buildings have slowly replaced the Cold War–era ones. The National Security Sciences Building, a modern TA-3 landmark, was completed in 2006 and replaced the old H-shaped Administrative Building. Today, the Laboratory sits on a campus of almost 35 square miles, and TA-3 is still at the heart of it all. ★



^ (Above) Map of TA-1 during the Manhattan Project. (Right) Aerial view of TA-1 in 1948.



THE MAN WHO WAS NEARLY OPPENHEIMER

By John Moore, National Security Research Center Archivist-Historian

Have you ever considered how the Manhattan Project – and perhaps even the world – might have been different if J. Robert Oppenheimer (above, far left) had not been the leader of Project Y?

We at the National Security Research Center – the Lab's classified library located in the NSSB – looked back at past Nobel recipient Carl David Anderson (above, second from left) and wondered what might have been.

LAB DIRECTOR ANDERSON? NOT QUITE.

In 1936, 31-year-old physicist Carl David Anderson was the youngest person at that time to receive the Nobel Prize for his discovery of the positron years earlier. (A positron is a subatomic particle with the same mass as an electron and a numerically equal positive charge.)

About six years later, he was approached by fellow physicist and Nobel Prize winner Arthur H. Compton, (above, second from the right) who brought with him three telegrams – two asked Anderson to head the government's top-secret project that would eventually produce the world's first atomic bombs. The third telegraph was a request that none other than Oppenheimer join Anderson's ongoing scientific work to discuss the "theorical aspects" of the project. (Oppenheimer would have worked as Anderson's assistant.)

While at the California Institute of Technology (Caltech), where Anderson studied, taught, and researched, Anderson often interacted with Oppenheimer. Anderson recalled that Oppenheimer believed he would never be able to work on Project Y because of his past affiliation with the Communist Party. Anderson, however, didn't even pursue the job offer that ultimately helped end World War II and made Oppenheimer a household name.

NO REGRETS

In Anderson's autobiography, he said that his ability to head Project Y was out of his control, citing economic and family issues.

Anderson wrote, "I believe my greatest contribution to the World War II effort was my inability to take part in the development of the atomic bomb."

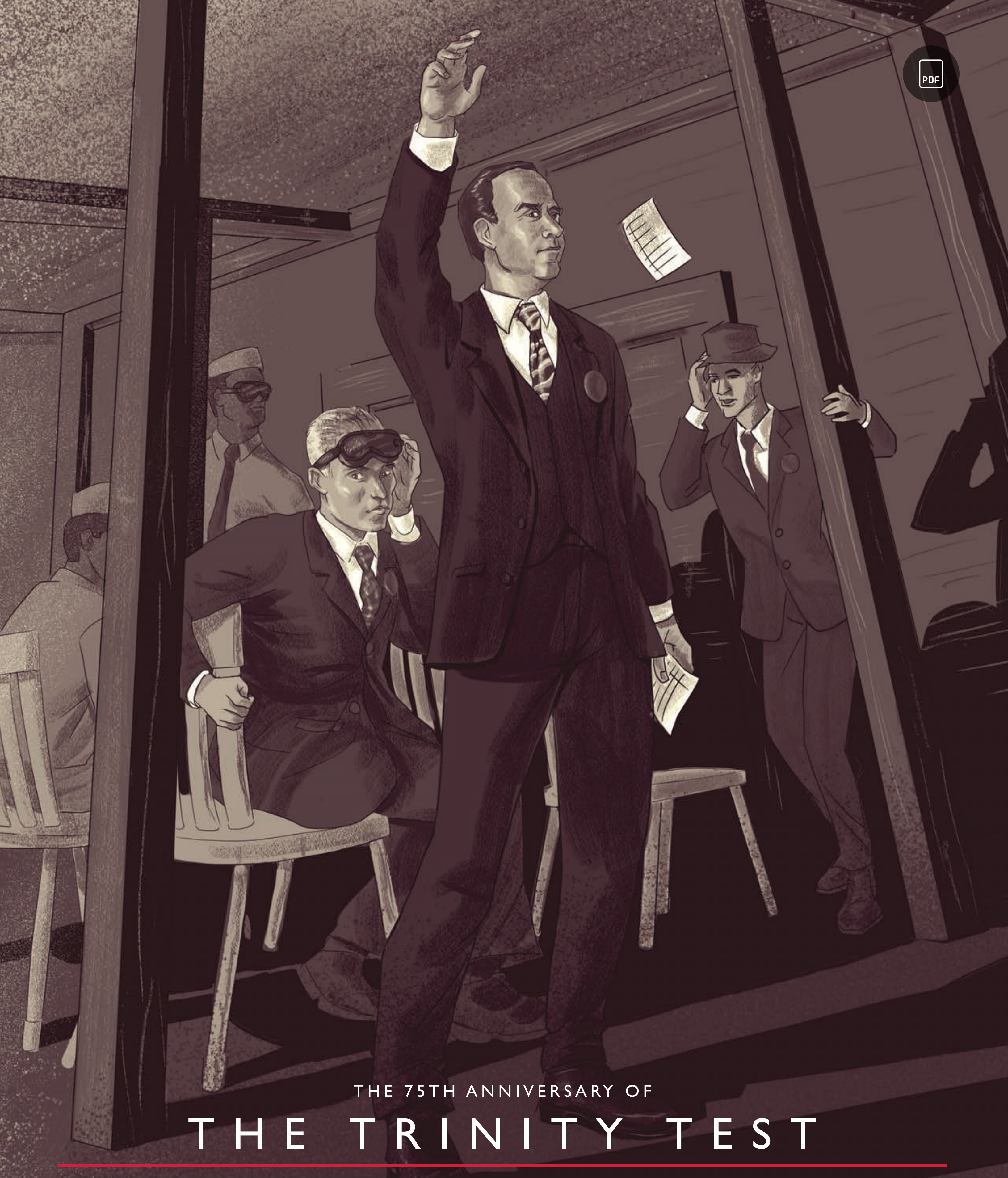
During WWII, Anderson played a major role in enabling allied aircraft to fire a variety of rockets that had been developed at Caltech.

Anderson would continue to interact with other famed Manhattan Project scientists, such as Seth Neddermeyer, who championed the implosion-style nuclear weapon called Fat Man. In the prewar years, Anderson had worked with Neddermeyer (above, right), who championed the discovery of the muon, which is similar to the electron, in 1936.

LASTING IMPACT

Anderson's discovery of the positron remains relevant today in various types of sciences, including particle accelerator experiments and what are commonly called PET scans, which help diagnose diseases.

In a 1990 interview with the *Los Angeles Times*, Anderson said he had no regrets about his decision not to lead Project Y because of the burden it had placed on his friend Oppie★



THE 75TH ANNIVERSARY OF

THE TRINITY TEST

"About 40 seconds after the explosion, the air blast reached me. I tried to estimate its strength by dropping from about six feet small pieces of paper before, during, and after the passage of the blast wave. Since, at the time, there was no wind I could observe very distinctly and actually measure the displacement of the pieces of paper that were in the process of falling while the blast was passing. The shift was about 2½ meters, which, at the time, I estimated to correspond to the blast that would be produced by ten thousand tons of TNT," said **Enrico Fermi, Los Alamos physicist and Nobel Laureate.**

NATIONAL SECURITY
RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

THE ROAD TO TRINITY

NUCLEAR AGE BEGINS 75 YEARS AGO

By Madeline Whitacre, Archivist-Historian, and Alan Carr, Senior Historian, National Security Research Center

Over the course of about 28 months (April 1943 – July 1945), the Laboratory developed two types of nuclear weapons. Little Boy, the gun-type weapon, did not undergo a full-scale nuclear test (see Page 30), but the implosion type weapon, Fat Man, famously did.

Although the Manhattan Project scientists were fairly confident that the Fat Man design would work, they weren't confident enough to drop a significant portion of the world's supply of plutonium over enemy territory. The decision to test was made, leading to what would become Trinity – the world's first nuclear explosion.

^ *Crews prepare for the Trinity Test in the New Mexico desert.*

LOCATION, LOCATION, LOCATION

Physicist Kenneth Bainbridge was chosen as the test director for Trinity. Meanwhile, the U.S. Army needed to find a suitable location to conduct the test, and a list of requirements was created by Bainbridge. The site would need to be flat and isolated and have consistently good weather; no Native Americans could be displaced. It also needed to be close to Los Alamos for ease of transportation and land acquisition. With these considerations in mind, several possible sites were selected.

Bainbridge chose Jornada del Muerto, about 200 miles south of Los Alamos. As a part of the Alamogordo Bombing and Gunnery Range, the location was already owned by the government, and it was near Los Alamos, but not so close that people would suspect it was connected to the Lab.

POETRY AND PLUTONIUM

Years later, in 1962, Gen. Leslie Groves wrote J. Robert Oppenheimer asking why the name "Trinity" was chosen. In his reply, Oppenheimer recalls that he had been reading John Donne's poetry around the time of the test and was inspired by the line: "Batter my heart, three person'd God."

Leading up to the test, there was some concern that the high explosives in the device would go off, but there would be no nuclear yield. If this happened, a large portion of the world's supply of plutonium would be strewn across the desert floor, and scientists wanted to be able to collect this rare material.

A concrete bowl was one idea that was explored for this purpose. A large, gently sloping concrete bowl would be constructed and filled with water. This would catch the dispersed plutonium, which would be collected as the bowl was drained. Although no concrete bowl was built at the Trinity site, a smaller model was constructed at Los Alamos.

Jumbo was another option for containment. Jumbo was a steel container built to withstand the force of a conventional explosive and contain the plutonium in the event of a failure. If the device was successful, Jumbo would be vaporized. Small-scale testing of "Jumbinos" took place at Los Alamos, and a full-size Jumbo vessel weighing more than 200 tons was built. Jumbo was built by the Babcock and Wilcox Steel Corporation of Ohio and was painstakingly transported to the Trinity site, though it was ultimately not used.

KEEPING SECRETS

As always, the secrecy and security of the site were important considerations. Many of the enlisted personnel stationed at the Trinity site did not know the purpose of the site that was being patrolled by military police. In order to keep the secret of the bomb after the Trinity test, two press releases were prepared in advance. One release stated that a munitions dump had exploded at the bombing range. There was some concern that the surrounding areas would need to be evacuated due to fallout, so the second press release stated that a munitions dump containing gas shells had exploded and some nearby populations may need to be temporarily evacuated.

Two large-scale experiments took place in preparation for the Trinity test. On May 7, 1945, several months before Trinity, just over 100 tons of TNT were detonated at the site, along with a radioactive tracer, to calibrate the equipment for Trinity and practice the timing of the test.

A full-scale mock-up of Fat Man (the implosion weapon) without the nuclear material was detonated on July 14, 1945, just two days before the Trinity test. The Creutz test, conducted by physicist Edward Creutz, took place at TA-18 in Los Alamos. The initial results were concerning – they indicated that Trinity wouldn't work. Luckily, physicist Hans Bethe, leader of T Division and future Nobel laureate, realized that the results had been calculated incorrectly. Trinity would, theoretically, be successful after all.

THE NUCLEAR AGE BEGINS

As the Trinity test day approached, assembly of the Gadget, which the device was nicknamed, began.

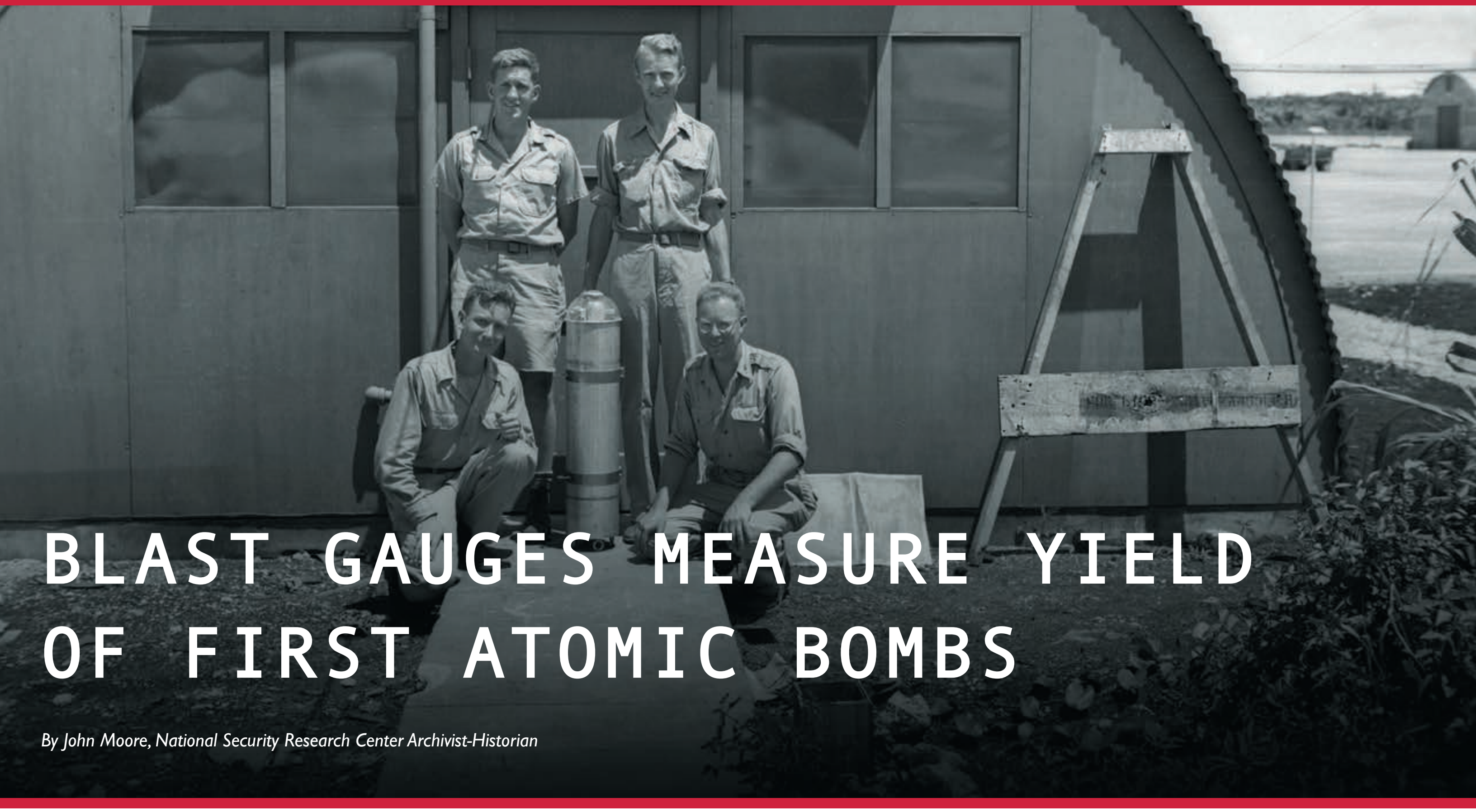
There were some tense moments during the preparation. When the engineers tried to place the plutonium into the device, it didn't fit because it had expanded due to the heat. The sphere was put in the shade to cool, and soon fit into the device. The Gadget was raised onto a 100-foot steel tower in anticipation for the test scheduled for 4 a.m., July 16, 1945. The morning of the test, however, brought thunderstorms, and the test was delayed for almost an hour and a half.

Finally, despite the setbacks and challenges, years of research and effort at the secret laboratory in Los Alamos, New Mexico, culminated at 5:29 a.m.

With the Gadget's detonation were an intense flash of light and a wave of heat, followed by a loud burst that echoed for miles. A ball of fire surrounded by a giant mushroom cloud stretched 3,280 feet wide and then rose in a column of smoke to a height in excess of 40,000 feet. The Gadget's power – equivalent to around 21,000 tons of TNT – destroyed the tower on which it had been placed.

Immediate feelings reportedly ranged from surprise to relief to jubilance to dread, with a common hope that World War II would be over soon. ★

^ *Director J. Robert Oppenheimer (center, left) and Gen. Leslie Groves inspect the Trinity test site after the Gadget's successful detonation.*



BLAST GAUGES MEASURE YIELD OF FIRST ATOMIC BOMBS

By John Moore, National Security Research Center Archivist-Historian

^ *Harold Agnew (top, left), Luis Alvarez (top, right), Lawrence Johnston (bottom, left) and Bernard Waldman (bottom, right) are seen here with a blast gauge, which they developed at the then-secret Los Alamos Lab to measure the yields of the atomic bombs that would be detonated in World War II.*

Little Boy's blast yield was equivalent to 15 kilotons of TNT, and Fat Man's blast yield was 21 kilotons.

The only two atomic bombs ever used in war were catastrophic, but how was the power of these weapons measured?

MEASURING ENERGY

Assigned by Director J. Robert Oppenheimer, Manhattan Project scientist Luis Alvarez set out to find a method for measuring the blast from the Lab's atomic bombs released in 1945 on Hiroshima and Nagasaki in an effort to help end World War II.

The explosive yield of a nuclear weapon is the amount of energy released when detonated and is measured in kilotons. Blast gauges were used to measure the yield of the first atomic test. Several of the yield diagnostics observed include neutrons, gamma rays, and the explosion's fireball as it expanded.

The B-29 aircraft was chosen to deliver the atomic bombs, but it could not carry any of the existing yield-measuring devices due to their weight. Alvarez knew he would need to create a new mechanism.

A NEW BLAST GAUGE

Alvarez, along with Wolfgang "Pief" Panofosky and Jesse DuMond, first began adapting existing microphone detectors. Placing these detectors on cylindrical aluminum canisters with heaters, power amplifiers, and batteries, they assembled a blast gauge that could receive frequencies measuring yield, while being transported on the aircraft for the atomic strikes on Japan.

Just prior to the aircrafts' takeoff, the blast gauges were outfitted with receivers, oscilloscopes, and cameras for recording data. The information could then be dialed in on the diagnostic radars and radios on board the B-29s. Alvarez and his team were able to make yield estimates of the bombings from data taken by two blast gauges and three films. Alvarez rode in an aircraft accompanying the Enola Gay when it dropped Little Boy on Hiroshima on Aug. 6, 1945.

SCIENTIFIC CONTRIBUTIONS

After WWII, Alvarez returned to the University of California, Berkeley. He was bestowed the Nobel Prize in 1968 for his use of bubble chambers to detect new subatomic particles, which was among many diverse career accomplishments.

Alvarez died from cancer in 1988. He was 77 years old.

Alvarez's colleague Marvin L. Goldberger said Alvarez was "one of the most imaginative, creative, and inventive scientists I ever encountered," according to his obituary in *The New York Times*. "He thought all the time about real problems and then ways to deal with them." ★

WOMEN OF PROJECT Y

In honor of Women's History Month, we remember the hundreds of women who worked as part of the Manhattan Project at Los Alamos to develop the world's first nuclear weapons, which helped end World War II. Their pictures and stories are part of the private collection of the National Security Research Center, the Lab's classified library.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

THE LAB'S FIRST FEMALE EMPLOYEES

By Madeline Whitacre, National Security Research Center Archivist-Historian

Women have contributed to the mission of the Laboratory since its establishment in 1943, when it was known as Project Y and charged with developing the world's first atomic bomb. During World War II, women consisted of about 11 percent of the Lab's workforce.

At the turn of the century, few women worked outside of the home, but as World War II progressed, more and more men were sent to fight in the European and Pacific theaters. The need for women to join the workforce in support of the war became clear. Although a particularly high influx of women worked in factories, this phenomenon occurred across many sectors, including the secret laboratory in Los Alamos.

MILITARY SERVICE

A significant portion – about 40 percent – of women employed in Los Alamos through the end of the Manhattan Project era were members of the Women's Army Corps, or the WAC.

Recruiting workers with technical skills and other relevant experience was difficult during the war – many qualified individuals were already in the armed forces or working on other government-sponsored projects for the war, and the WAC was a way to bring women with technical skills in the army to the Lab.

In August of 1943, the detachment here consisted of four officers and 43 enlisted women. At its peak in August of 1945, the Los Alamos detachment had a total of about 260 women, though after this point, the number of WACs steadily declined until October 1946, when the detachment was deactivated.

WACs held positions throughout the Lab, supporting its wartime mission directly and indirectly. Many WACs worked as medical staff, cooks, librarians, and in various other roles, such as drivers, supply clerks, and scientific researchers, which had traditionally been filled by men.

When the Laboratory was first established, Director J. Robert Oppenheimer believed that the project could be completed with just a few hundred workers on The Hill. Near the end of the war, however, the population of Los Alamos was around 8,000, and there was a constant shortage of housing and labor. The project wanted to make use of anyone who could help, and most of the wives of scientists contributed to the project in some way.

SCIENTIFIC WORK

Some of the women who came to Los Alamos were recruited as scientists and worked on the same technical problems as their male counterparts. By May of 1945, about 30 of the estimated 1,700 total technical or scientific staff were women.

Norma Gross was one of the many women who contributed to the wartime Laboratory. Gross was a trained chemist with a master's degree, which she earned in 1938 from Bryn Mawr College in Pennsylvania. A member of the WAC, she was granted her security clearance in December of 1943 and was stationed at Los Alamos. Because of her background as a chemist, Gross was sent to work in the Chemistry and Metallurgy Division (CMR). Specifically, her group conducted experiments that studied shock-wave behavior to support the design of Fat Man.

Known as RaLa experiments, they used radiolanthanum to verify and improve compression models from the Theoretical Division. After the war ended, Gross was honorably discharged from the WAC, but her supervisors wanted to keep her on staff. So, in September of 1945 she was hired as an associate scientist in CMR.

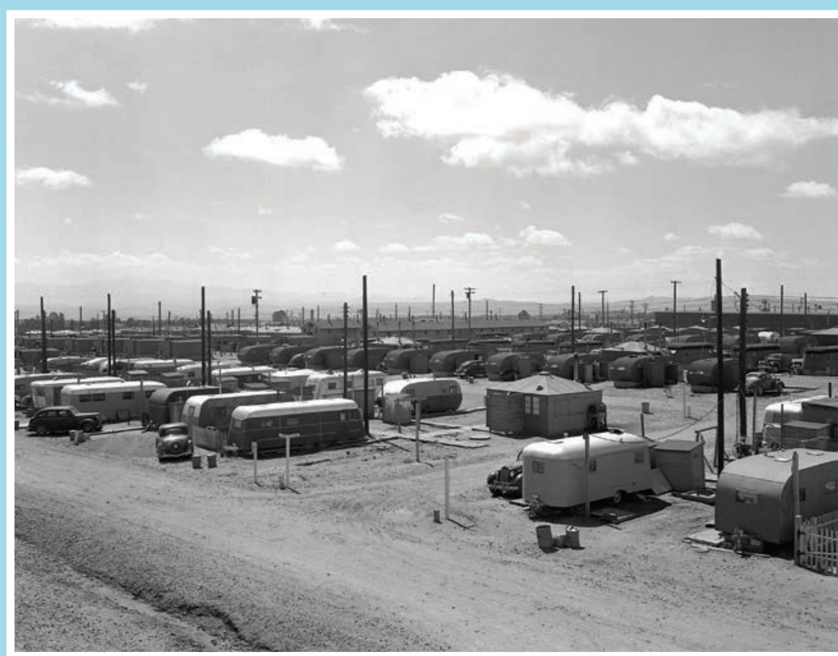
Gross resigned from the Laboratory in February of 1946 – at a time when the future of the Los Alamos facility was uncertain and many were returning to their lives before World War II.

^ *Chemist Norma Gross and one of her colleagues remotely handle a radiation source at the Lab in Los Alamos. Gross, one of the Lab's first female scientists, worked in Los Alamos during and after World War II, leaving her job in the winter of 1946, when the postwar future of the Lab was still uncertain.*

THE LAB TODAY

Looking at the Laboratory today, there is far more opportunity for women in all positions than during the Manhattan Project years. Over the decades, we've seen more and more women in scientific and leadership roles. This is reflective of a more inclusive institution, as well as expanding opportunities for women in higher education and society in general. These broader opportunities lead to a larger pool of qualified workers from which the Lab can tap. ★

^ *Labor was not the only thing in short supply – housing in Los Alamos was also scarce because of the rapid growth of the town's population.*



POLITICAL FIGURES THROUGHOUT HISTORY VISIT THE LAB

By John Moore, National Security Research Center Archivist-Historian

Regulars at the local restaurants could usually spot someone new in town. While the different faces were obvious, this time it was their shoes that were the giveaway, according to an eyewitness account from the '90s.

These men were dressed in casual clothes like the locals, but they wore black-tasseled dress shoes – a telltale sign of U.S. Secret Service agents. Then-President Bill Clinton would be arriving in Los Alamos shortly.

Over the past 75 years, many public figures have visited the Lab, including several politicians. Collections in the National Security Research Center contain photos from these historic visits – some haven't been seen in more than 20 years. ★

The National Security Research Center has a highly-trained, expert staff of librarians, archivists, historians, digitizers, and more who offer personalized services and research assistance.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY

VOYAGE OF DISCOVERIES

Fascinating finds are down every aisle and around every corner in the National Security Research Center, the Lab's classified library.

An original pencil drawing of Little Boy's bomb case. Handwritten notes by J. Robert Oppenheimer. Classified notebooks of Nobel laureates. And, the vast collections of materials from history's greatest scientific minds that researchers rely upon today.

Too great in number to list in their entirety, here are just some of the highlights of the materials in the NSRC.

FAT MAN NUCLEAR WEAPON ASSEMBLY MANUAL

- **What is this?** A step-by-step manual that shows how to assemble a Fat Man (implosion) nuclear weapon.
- **Why is it important?** This unique, how-to book is a one-of-a-kind reference material from the late 1940s that includes drawings and photographs.
- **Why is this item remarkable?** Several copies of this manual were reportedly made, but this is the only known copy that remains in existence. Gerry Strickfaden gave this copy of the manual to the NSRC. He worked as a mechanical engineer and began his career at LANL when it still employed many Manhattan Project veterans.

PATENT FOR "SUPER"

- **What is this?** Scientists Edward Teller and Stanislaw Ulam jointly conceived the breakthrough idea for the world's first thermonuclear device (also known as the hydrogen bomb). Their idea is recorded in this patent from 1946.
- **Why is it important?** This original document records an idea that changed the world.
- **Why is this item remarkable?** The one-of-a-kind document includes freehand drawings of the world's first thermonuclear device. Ivy Mike was the first full-scale test of a hydrogen bomb detonated on November 1, 1952.

PROJECT ROVER COLLECTION

- **What is this?** One of the world's first heat pipes and a piece of a Rover nuclear-thermal rocket engine. Project Rover (1955–1973) was likely the largest program in the Lab's history.
- **Why is it important?** Heat pipes were invented as part of the Rover Program; they are relatively simple devices to safely distribute heat. Heat pipes are now used in many things, including common electronic devices. The rocket engine component is representative of many Rover components – a very light graphite block in a special coating to protect the graphite from extreme heat.
- **Why is this item remarkable?** This heat pipe is one of the first two ever constructed. Since George Grover invented the heat pipe in 1963, billions have been built.

BRITISH MISSION REPORTS COLLECTION

- **What is this?** A collection (1943–1963) of documents, memos, and research provided by Great Britain and British scientists who came to Los Alamos during the Manhattan Project.
- **Why is it important?** The collection provides detailed information on the work done by the group here during World War II.
- **Why is this item remarkable?** The collection gives background information on British research prior to the U.S. entry into World War II and how this helped the Manhattan Project.

PAUL WHALEN COLLECTION

- **What is this?** A collection of Paul Whalen's published papers, reports, and reference materials related to weapons codes and hydrodynamic testing that date back to the 1960s. Whalen was a weapons designer, weapons physics expert, and computational capabilities developer who worked at the Lab for 61 years and pioneered significant weapons physics advancements.
- **Why is it important?** Whalen was responsible for many firsts associated with radiochemistry insertion into codes, gamma-ray output codes and calculated cross sections, X-ray source devices, and alpha diagnostic codes. Notably, he also helped to establish modern international radiation-exposure standards, which have protected thousands of people around the world.
- **Why is this item remarkable?** Whalen joined the Lab's primary design group in 1956, which was an active time in the United States' nuclear weapons program. He would eventually be regarded as an expert in nuclear survivability.

LAWRENCE LIVERMORE NATIONAL LABORATORY REPORTS

- **What is this?** The NSRC provides access to all of LLNL's nonlimited reports, LLNL documents that LANL does not have in our collections (for example, data from a variety of important experiments). Additionally, LANL's Online Vault has tens of thousands of LLNL documents that LANL researchers use daily, thanks to a mutual exchange agreement.
- **Why is this important?** Access to and exchange of materials, including legacy documents and current research approved for exchange, are vital to the success of LANL's scientists, engineers, and researchers.
- **Why is this item remarkable?** Hundreds of documents are exchanged between LANL and LLNL, strengthening each national lab's efforts in support of a common national security mission.

NERSES "KRIK" KRIKORIAN COLLECTION

- **What is this?** A collection dating from 1946 to the mid-1990s of Nerses "Krik" Krikorian's Russian technical books and reports, Union Carbide Corporation papers, Project Rover reports, technical notes, memoranda, and photos. Krikorian was a chemist and intelligence officer. He worked at the Lab for 45 years.
- **Why is it important?** The collection contains Krikorian's scientific and intelligence work, as well as critical work on Project Rover – he was responsible for ensuring that certain materials would support the rigorous demands of nuclear propulsion at high temperatures.
- **Why is this item remarkable?** These materials, some in Russian, are of work that was especially challenging at the time because of the lack of field research. Krikorian learned Russian while working on Project Rover because the only books he could find were written in that language.

ROCKY FLATS COLLECTION

- **What is this?** Reports, film, and other materials from the Rocky Flats Plant, which was a U.S. manufacturing complex near Denver, Colorado. Before the plant closed in 1992, it produced nuclear weapons parts, primarily plutonium pits, that were shipped to other facilities for weapons assembly.
- **Why is it important?** This large collection includes documentation of nuclear weapons parts as they went into the stockpile and technical reports describing efforts by Rocky Flats researchers to develop new pit technologies.
- **Why is this item remarkable?** These materials are important for the Lab's current pit-production mission.

The Story of Oscar Seborer, ATOMIC SPY

Story by Alan Carr, National Security Research Center Senior Historian

It's been long known that Theodore "Ted" Hall, Klaus Fuchs, and David Greenglass committed espionage at Los Alamos during World War II. Each worked at the secret Laboratory charged with creating the world's first atomic bomb, stole classified weapons information, and shared it with the Soviet Union.

Just recently though, in September 2019, historians confirmed a fourth wartime spy: Oscar Seborer. But who was he, what do we know about him, what did he steal, and what happened to him?

WORKING AT THE LAB

Seborer was born in New York City in 1921. Little is currently known of his early life, but when WWII started, he was studying electrical engineering at Ohio State University. He joined the Army in the fall of 1942 and, given his academic training, was assigned to the Army's Special Engineering Detachment (SED). Private Seborer was initially sent to Oak Ridge; in December 1944, he transferred to Los Alamos.

Late in 1944, the Explosives Division (X) was struggling with detonator development. Seborer's Group, Detonator Circuit (X-5), was tasked with developing electrical equipment for measuring explosives tests and the firing circuits to ignite the implosion bomb's detonators. Significant progress was made on the detonator circuit in early 1945, so in April, freshly promoted Technician Fifth Class (Corporal) Seborer was loaned to the Research Division to help prepare for the upcoming Trinity test, which would be the first successful detonation of a nuclear bomb.

Part of Seborer's assignment included working on the rehearsal for Trinity, the 100-Ton Test. The same day the rehearsal was completed, May 7, Seborer's group leader in X-5 requested his immediate return. Although this was approved, only a dozen days later Trinity's Test Director Kenneth Bainbridge asked X-5 to return Seborer to the Research Division no later than mid-June because he was "extremely valuable" to their work. Although he had only spent a year and a half as a private, that summer Seborer was promoted for the second time in six months, this time to Technician Fourth Class (Sergeant). It's clear Seborer was in high demand and also highly thought of by his managers.

Seborer asked to be transferred to the Destination Program in May 1945. The program was tasked with preparing the atomic bombs for deployment to Japan, but it's unclear if Seborer's request was granted. After the war, however, X-5 was transferred to Z Division, which had inherited many of the Destination Program's responsibilities. Only a few years later, Z Division became an independent organization – what is today Sandia National Laboratories.

HARDLY THE FATHER OF THE SOVIET ATOMIC BOMB

A January 27, 2020, *New York Times* article proclaimed Seborer's "knowledge most likely surpassed that of the three previously known Soviet spies at Los Alamos, and played a crucial role in Moscow's ability to quickly replicate the complex device."

However, records in the National Security Research Center (NSRC), LANL's classified library, do not support that conclusion.

Even after his two promotions, Seborer only had a limited view of the overall project. He likely knew a considerable amount about the implosion bomb's firing circuit, and he would have known something about diagnostic measuring equipment and techniques. Because he may have participated in the Destination Program and because he worked in Z Division, Seborer may also have known something about the general concept of implosion and assembly procedures for the atomic bombs.

But, any knowledge Seborer would have been privy to would have been greatly eclipsed by that of his fellow mole, Klaus Fuchs.

Fuchs was a senior theoretical physicist. Like Seborer, Fuchs worked at Oak Ridge before joining the Los Alamos staff. Though nothing is known about Private Seborer's work at Oak Ridge, it is known that Fuchs helped design the control system for the gaseous diffusion plant for enriching uranium.

At Los Alamos, Fuchs was considered a technical staff member; he independently authored several reports and coauthored others with his Division Leader and future Nobel laureate Hans Bethe. Fuchs knew as much as anyone about the implosion bomb because he played a major role in its development.

> "SEBORER ONLY HAD A LIMITED VIEW OF THE OVERALL PROJECT."

EVADING PROSECUTION, BUT NOT CONTEMPT

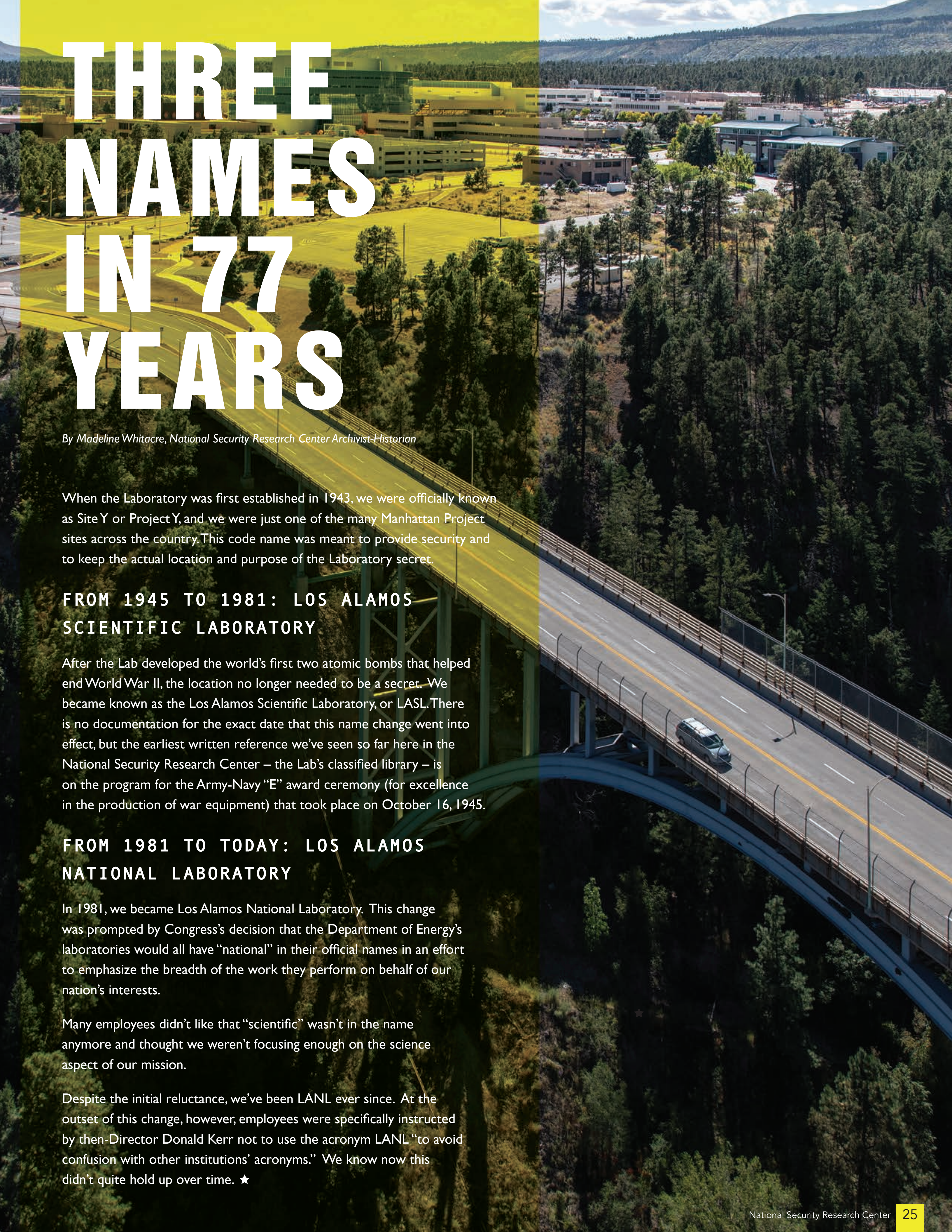
Though the discovery of Seborer's treachery is an immense contribution to the story of Manhattan Project–era espionage, the prevailing narrative remains unchanged: Fuchs was, by far, the most damaging spy of wartime Los Alamos.

In 1950, Klaus Fuchs confessed and spent nearly a decade in prison. Shortly after, Julius and Ethel Rosenberg (sister of Los Alamos spy David Greenglass) were sentenced to death for committing espionage elsewhere on behalf of the Soviets, and Seborer quietly slipped out of the country.

Through an informant, FBI investigators discovered Seborer was a spy in 1955. By then, however, he had already immigrated to the Soviet Union.

Thus, the story of Oscar Seborer remained buried in classified FBI files until it was unearthed by professor Harvey Klehr and historian John Earl Haynes just months ago.

Records from the NSRC provide a technical context for Seborer's tale, which came to an end April 23, 2015, with his death in Moscow. ★



THREE NAMES IN 77 YEARS

By Madeline Whitacre, National Security Research Center Archivist-Historian

When the Laboratory was first established in 1943, we were officially known as Site Y or Project Y, and we were just one of the many Manhattan Project sites across the country. This code name was meant to provide security and to keep the actual location and purpose of the Laboratory secret.

FROM 1945 TO 1981: LOS ALAMOS SCIENTIFIC LABORATORY

After the Lab developed the world's first two atomic bombs that helped end World War II, the location no longer needed to be a secret. We became known as the Los Alamos Scientific Laboratory, or LASL. There is no documentation for the exact date that this name change went into effect, but the earliest written reference we've seen so far here in the National Security Research Center – the Lab's classified library – is on the program for the Army-Navy "E" award ceremony (for excellence in the production of war equipment) that took place on October 16, 1945.

FROM 1981 TO TODAY: LOS ALAMOS NATIONAL LABORATORY

In 1981, we became Los Alamos National Laboratory. This change was prompted by Congress's decision that the Department of Energy's laboratories would all have "national" in their official names in an effort to emphasize the breadth of the work they perform on behalf of our nation's interests.

Many employees didn't like that "scientific" wasn't in the name anymore and thought we weren't focusing enough on the science aspect of our mission.

Despite the initial reluctance, we've been LANL ever since. At the outset of this change, however, employees were specifically instructed by then-Director Donald Kerr not to use the acronym LANL "to avoid confusion with other institutions' acronyms." We know now this didn't quite hold up over time. ★

CUSTOMERS

The National Security Research Center provides assistance to a breadth of customers at Los Alamos National Laboratory and beyond.

STATE-OF-THE-ART

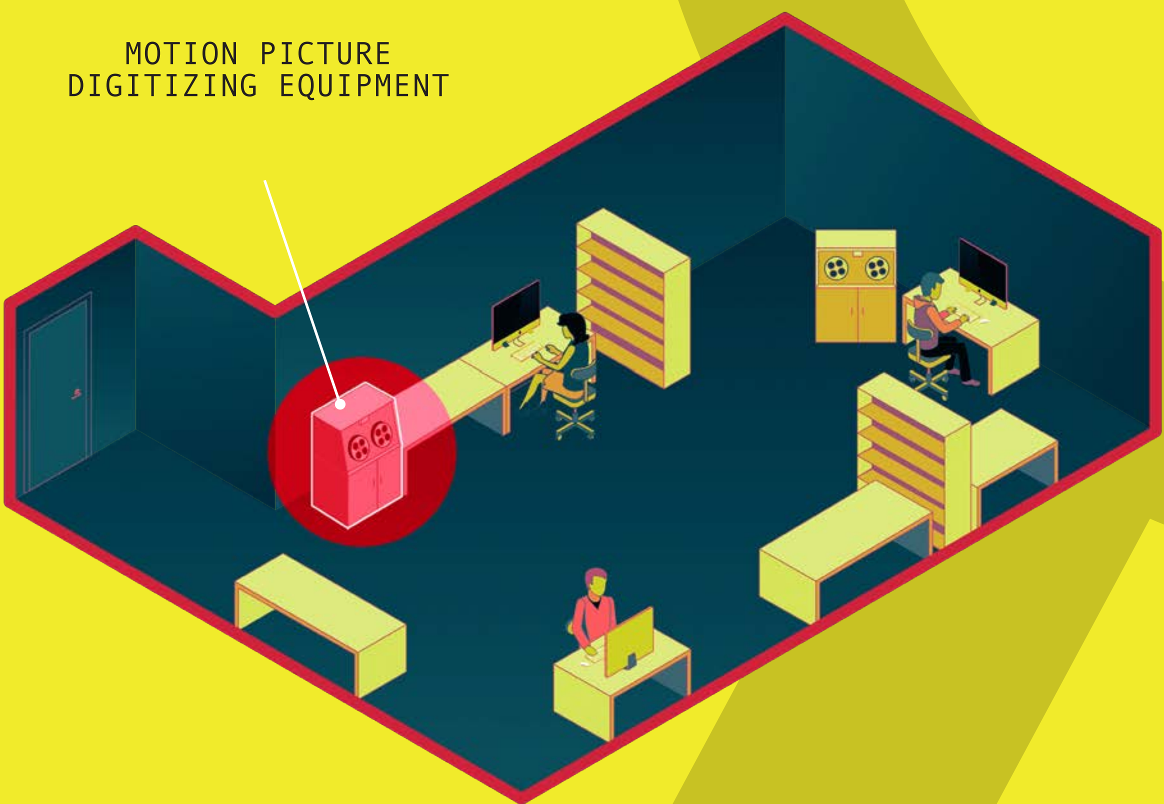
DIGITIZING FACILITIES

Illustrations by Don Montoya, Graphic Artist

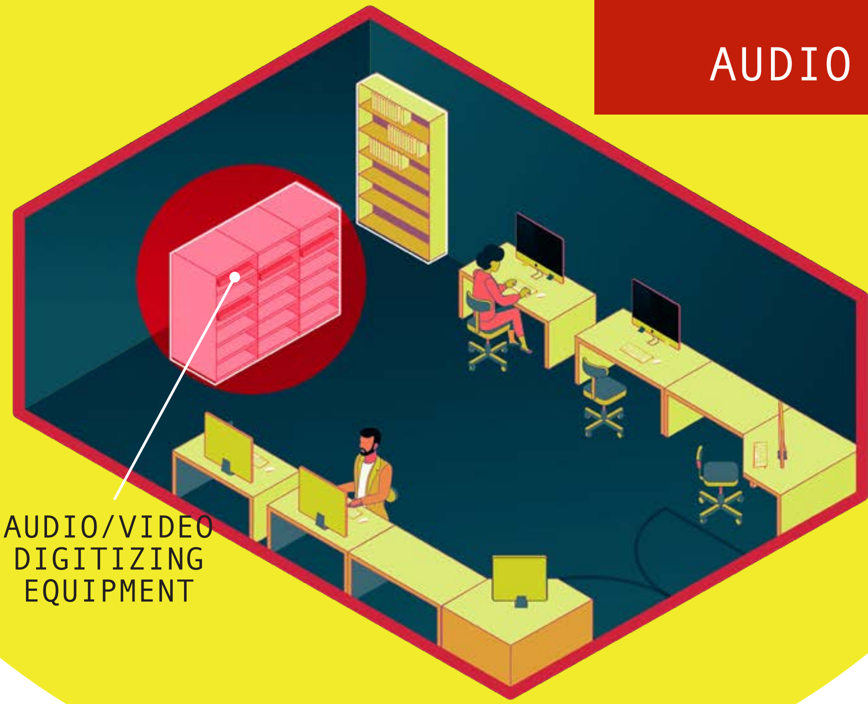
State-of-art equipment and more than a dozen highly trained staff at the National Security Research Center preserve materials dating from today to the early days of the Manhattan Project. These materials are at risk of deterioration and, in many cases, are the only copy in existence, including documentation of nuclear weapons test shots.

There are six digitization labs: video tapes, audio tapes, motion picture films, microfiche, microfilm, and a specialized lab (not illustrated here) that digitizes paper, engineering drawings, notebooks, and other unique media. ★

MOTION PICTURE FILM DIGITIZATION LAB



VIDEO DIGITIZATION LAB
+
AUDIO DIGITIZATION LAB



MICROFILM DIGITIZATION LAB
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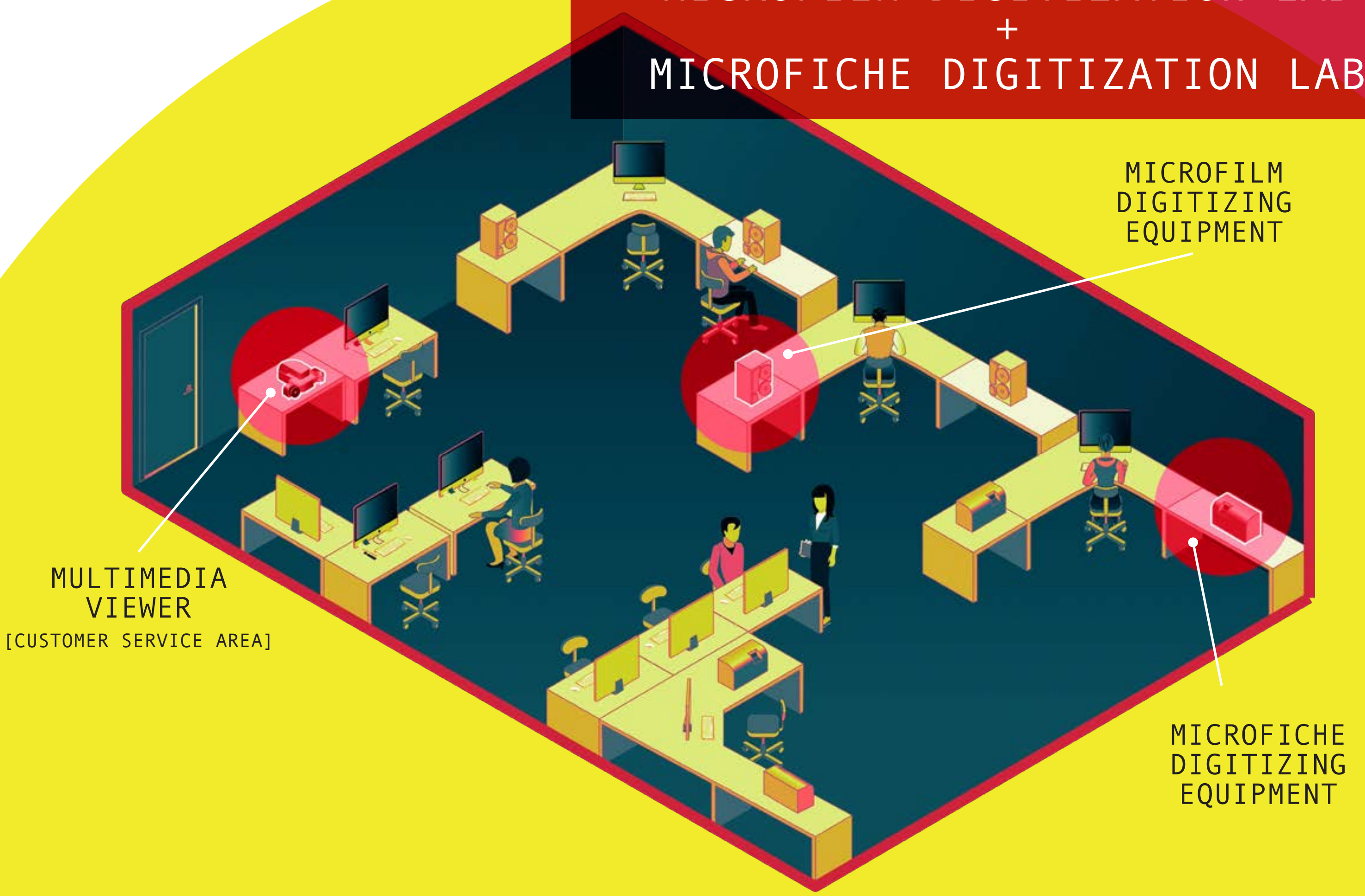
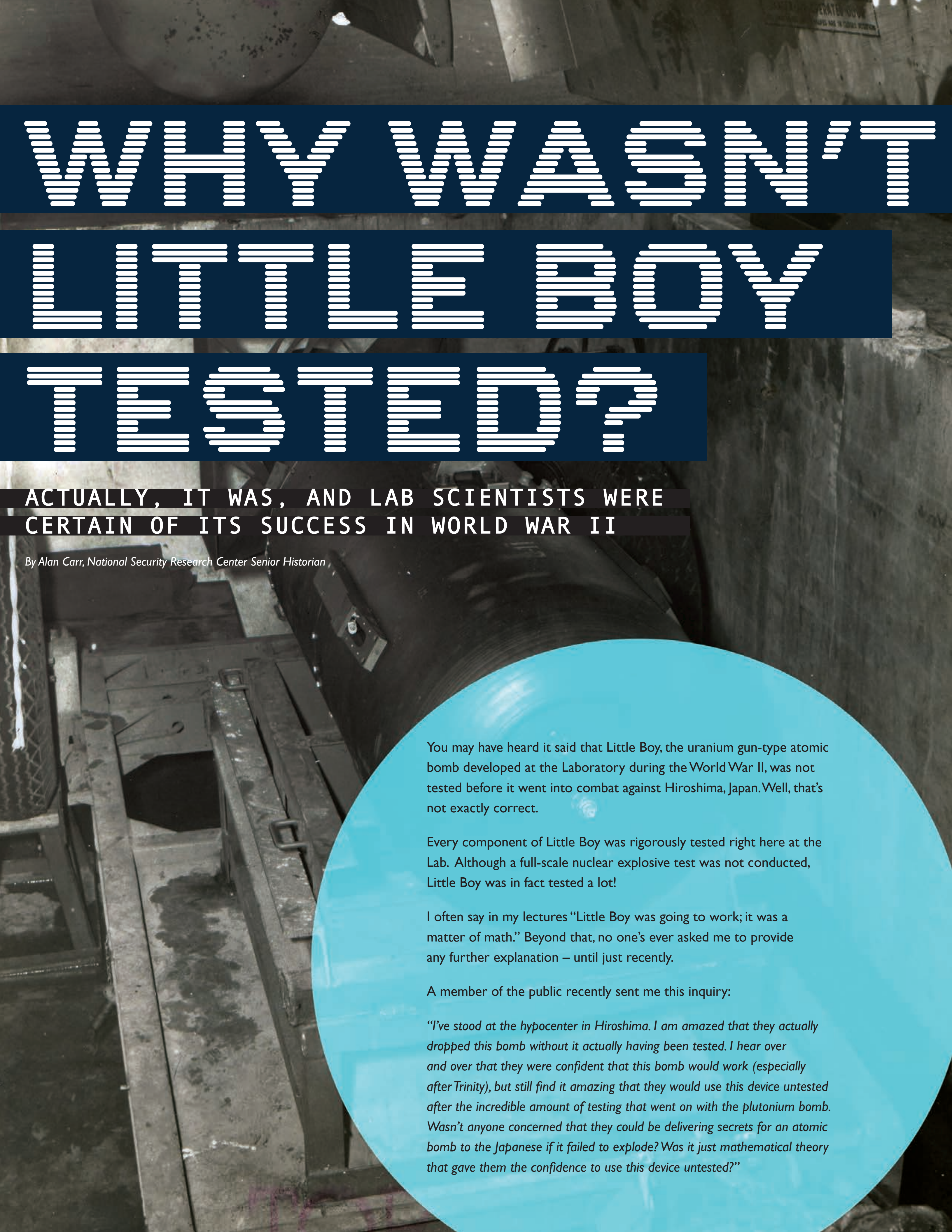




WHY WASN'T LITTLE BOY TESTED?

ACTUALLY, IT WAS, AND LAB SCIENTISTS WERE CERTAIN OF ITS SUCCESS IN WORLD WAR II

By Alan Carr, National Security Research Center Senior Historian

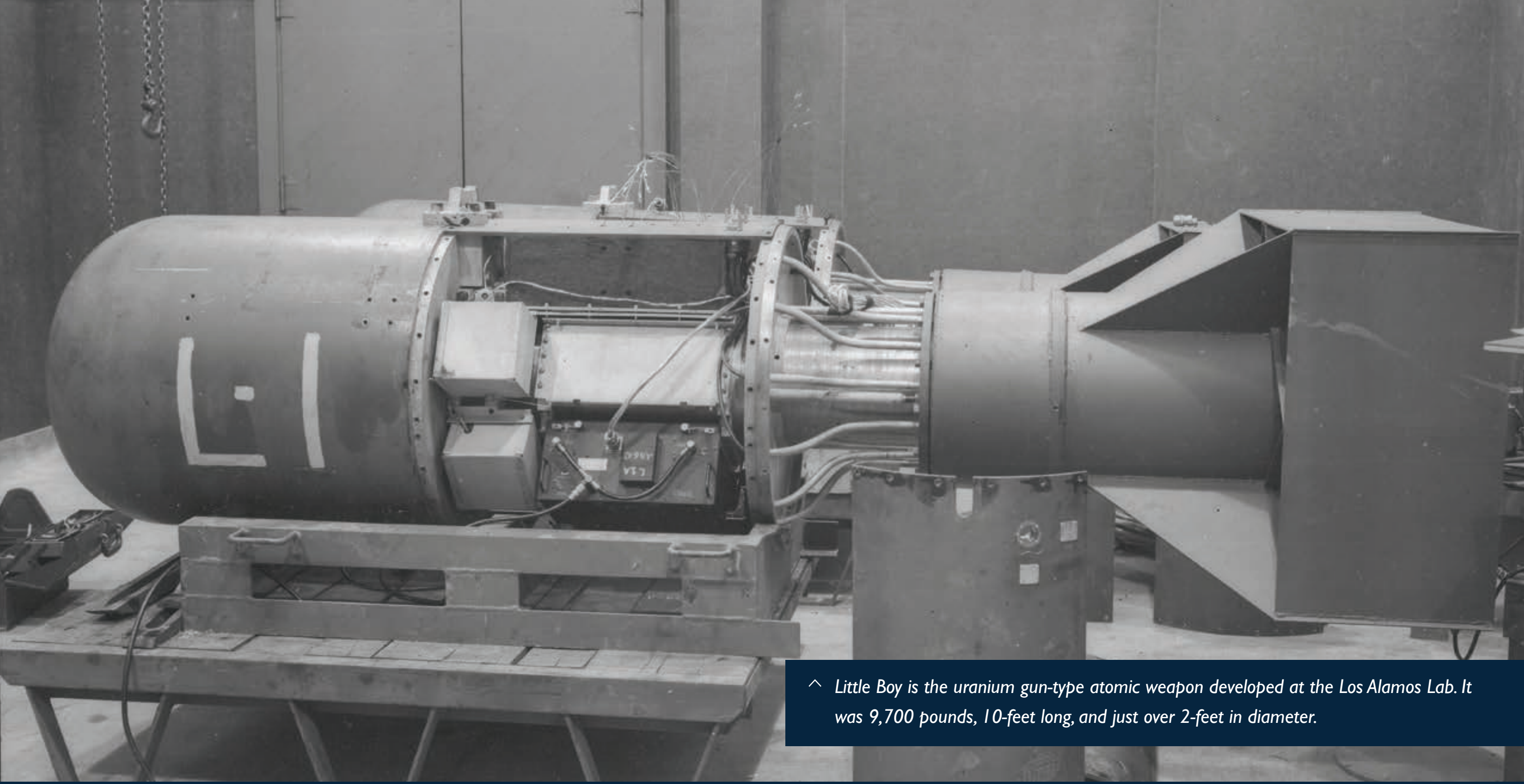
You may have heard it said that Little Boy, the uranium gun-type atomic bomb developed at the Laboratory during the World War II, was not tested before it went into combat against Hiroshima, Japan. Well, that's not exactly correct.

Every component of Little Boy was rigorously tested right here at the Lab. Although a full-scale nuclear explosive test was not conducted, Little Boy was in fact tested a lot!

I often say in my lectures "Little Boy was going to work; it was a matter of math." Beyond that, no one's ever asked me to provide any further explanation – until just recently.

A member of the public recently sent me this inquiry:

"I've stood at the hypocenter in Hiroshima. I am amazed that they actually dropped this bomb without it actually having been tested. I hear over and over that they were confident that this bomb would work (especially after Trinity), but still find it amazing that they would use this device untested after the incredible amount of testing that went on with the plutonium bomb. Wasn't anyone concerned that they could be delivering secrets for an atomic bomb to the Japanese if it failed to explode? Was it just mathematical theory that gave them the confidence to use this device untested?"



^ *Little Boy is the uranium gun-type atomic weapon developed at the Los Alamos Lab. It was 9,700 pounds, 10-feet long, and just over 2-feet in diameter.*

I have to admit, that's something I couldn't entirely answer off the top of my head. The plutonium implosion device, Fat Man, was indeed more complicated and thus required more testing. And it's true there was a genuine concern the enemy might be able to recover the fissile material (albeit with tremendous difficulty) if a Fat Man-type bomb was not a successful nuclear explosion. For instance, Trinity Test Director Kenneth Bainbridge stated in a report from 1945: "No one was content that the first trial of a Fat Man gadget should be over enemy territory, where, if the gadget failed, the surprise factor would be lost and the enemy might be presented with a large amount of active material in recoverable form."

But why were scientists certain Little Boy would work?

That's something I needed help with. As such, I went to my friend Dick Malenfant, a retired criticality expert who spent decades working at the Lab, to get his thoughts. Dick wrote in an email:

"'Experiments with the Dragon Machine' includes a complete transcription of the original handwritten notes on the experiments that were located in an old file safe at (the Lab's former) Pajarito site, a copy of a presentation made by (nuclear physicist) Otto Frisch at a fast burst reactors conference held in Albuquerque, January 28–30, 1969, and a copy of the original 'Controlled Production of an Explosive Nuclear Chain Reaction' (Frisch et al., September 27, 1945). Those experiments were crucial to the proof that an explosive reaction based upon prompt neutrons could be produced. This provided the final verification that Little Boy would function as designed."

Notice Dick uses the word "proof." In reviewing the material he provided, you'll see how experiments proved Little Boy would work.

The scientists were not simply confident Little Boy would work, they knew Little Boy would work. Thus, it went into combat without a nuclear explosive test. It was mathematical certainty.

This interesting historical tidbit comes with a couple of important lessons: First, there's a big difference between confidence and certainty, and it takes some form of testing to bridge the gap. Second, don't be afraid to question your friendly neighborhood historian! Make me earn my pay! ★

^ *The Enola Gay was the B-29 that delivered Little Boy, the world's first atomic bomb used in combat, over Hiroshima, Japan, on Aug. 6, 1945. Los Alamos scientists were certain of the weapon's success before it was deployed.*

WHO HAS THE FIRST Z NUMBER?

By Alan Carr, Los Alamos National Security Research Senior Historian Center

Not long ago, Joshua Romero of Communications Arts and Services asked me if I knew the story behind Z numbers. For quite some time, unfortunately, I was unable to find a conclusive answer. Meanwhile, my friend Cat Christoffersen of the Science Resource Office asked me for the Z numbers of several famous Manhattan Project scientists:

LUIS ALVAREZ – 025719
SETH NEDDERMEYER – 006831
J. ROBERT OPPENHEIMER – 040640
JOHN VON NEUMANN – 010806
VICTOR WEISSKOPF – 012715

Wait a minute! Shouldn't J. Robert Oppenheimer, our legendary first director, have Z number 000001?

Z numbers were a postwar invention, so all those famous scientists received Z numbers years after the war when they returned to the Lab as guests.

It turns out (drumroll, please), Z number 000001 belonged to Elmo Rich Morgan.

"Elmo who?" you ask? I certainly did.

NUMBER 1

First, I contacted Human Resources staff; they could not locate a personnel file for Elmo. "Hmm, maybe he was a subcontractor or a Fed?" I wondered. As such, I turned to one of my favorite Feds, Philippa Griego, at the Los Alamos Field Office. Not only was Philippa able to confirm Elmo worked for the Atomic Energy Commission (predecessor to the Department of Energy), but she also found his obituary and even a delightful transcribed oral history.

So, who is Elmo Morgan, and what connection does he have to Los Alamos? Elmo was a highly educated construction expert who served as an Army officer during World War II. His region included Los Alamos; thus he was personally ordered by the Manhattan Project's commanding officer, Gen. Leslie R. Groves, to build the Laboratory. The first thing he did was contract the Robert E. McKee Company to build the technical facilities and the M. M. Sundt Company to build living quarters. Morgan was also responsible for the construction of the Trinity test site.

When the war ended, Morgan was hired to manage a new company created by McKee to oversee all the nonscientific operations (except security) of Los Alamos. It was called the Zia Company.

So, let's get this straight: The first manager of the Zia Company has the first Z number. Could that be where "Z" numbers come from? Yes, and that fact is personally confirmed by Elmo. In an oral history interview, he said, "When Zia Company took over, they instituted a new system of passes with new numbers, all prefixed with a 'Z' for Zia." Mission accomplished!

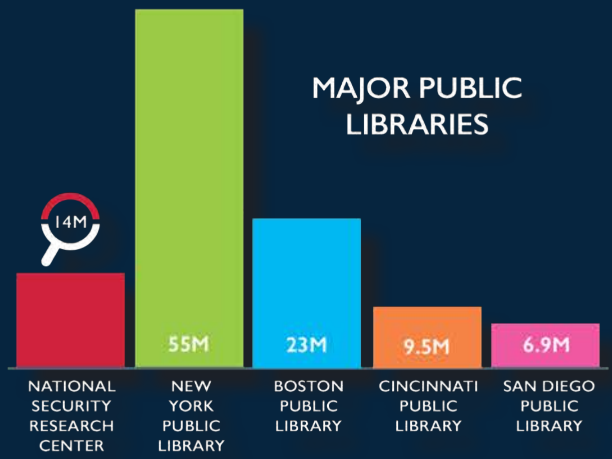
WHAT HAPPENED TO ELMO MORGAN?

The Zia Company came into existence in the spring of 1946, but Elmo didn't stay there long. As he managed Zia, Congress created the Atomic Energy Commission (AEC) to manage the nation's nuclear weapons complex. In 1947, Elmo became an AEC deputy area manager and, among other projects, built Omega Bridge and developed the Western Area in town. In 1950, Elmo became the area manager.

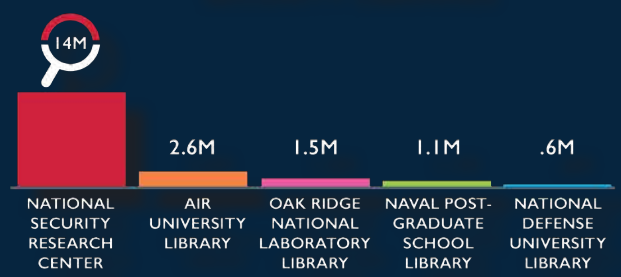
In October 1951, he accepted a job at the University of Utah and, later, at the University of California. Among other things, his work for the university and the Department of the Interior took him all over the world. He died in 2007 at the age of 93 and was survived by 13 grandchildren and 19 great-grandchildren. The man who held the first Z number certainly lived an incredible life! ★

LIBRARY COMPARISON
(BY HOLDINGS)

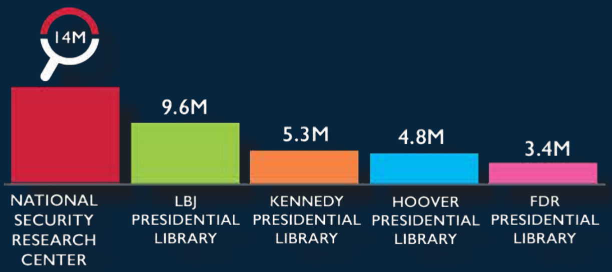
MAJOR PUBLIC LIBRARIES



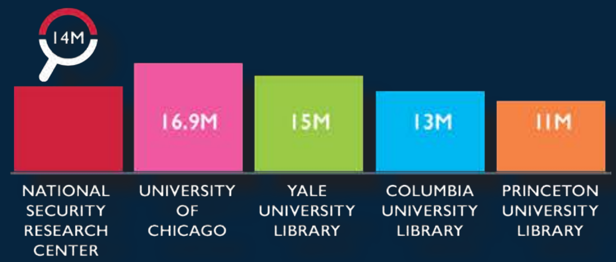
MAJOR NATIONAL SECURITY LIBRARIES



MAJOR ARCHIVAL LIBRARIES

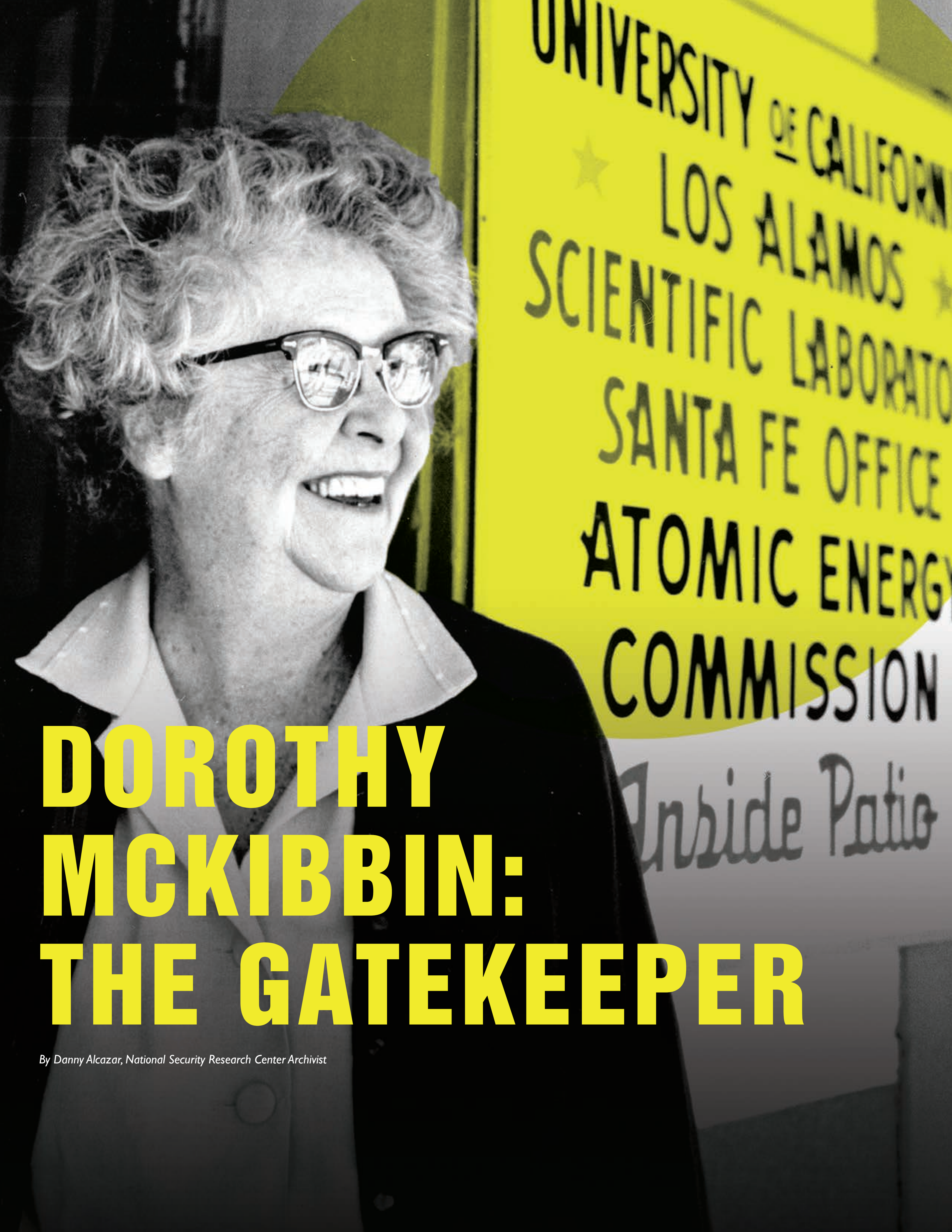


MAJOR UNIVERSITY LIBRARIES



The National Security Research Center is an active, dynamic research library with services and a volume of materials similar to the nation's other major research libraries.

NATIONAL SECURITY RESEARCH CENTER
LOS ALAMOS NATIONAL LABORATORY



DOROTHY MCKIBBIN: THE GATEKEEPER

By Danny Alcazar, National Security Research Center Archivist

Her job title was secretary, but really, she was [The Gatekeeper of Los Alamos.]

New scientists arriving to Santa Fe would be holding a letter with the directions, "Go to 109 E. Palace," where Dorothy McKibbin was waiting in her office. Dorothy would then type up the new employee's information on an index card, which quickly became known as the McKibbin Card, before they headed up the hill to Los Alamos.

Today, the National Security Research Center, which is the Lab's classified library and located in the National Security Sciences Building, has preserved the collection of McKibbin Cards. LANL archivists and historians often refer to them when responding to the frequently asked question: "I think I have a relative who worked at the Lab during the Manhattan Project – can you confirm that?"

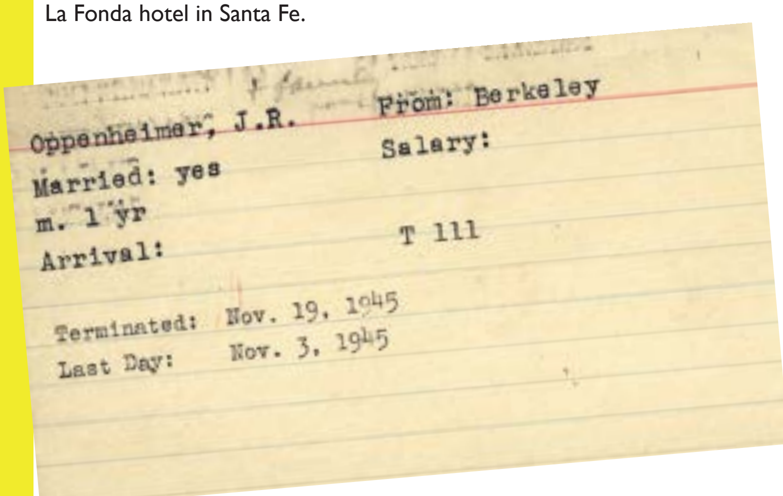
A HUNCH AND A JOB OFFER

One day in late March 1943, Dorothy was crossing the street in Santa Fe, when she ran into local businessman Joe Stevenson. Joe knew she was looking for work and asked Dorothy if she would be interested in a job as a secretary.

"Secretary of what?" Dorothy asked.

"Secretary – don't you know what a secretary does?" replied Joe.

Dorothy had a strong hunch the job had to do with the government or World War II. Joe gave her 24 hours to think it over and, if interested, to meet her potential employer the following day in the lobby of the La Fonda hotel in Santa Fe.



Oppenheimer, J.R.
From: Berkeley
Married: yes
Salary:
m. 1 yr
T 111
Arrival:
Terminated: Nov. 19, 1945
Last Day: Nov. 3, 1945

^ *J. Robert Oppenheimer's McKibbin Card. The cards were employment verification and were issued to every Lab employee during the Manhattan Project era. Today, Lab historians and archivists maintain the preserved collection of McKibbin Cards at the National Security Research Center – the Lab's classified library located in the National Security Sciences Building.*

MYSTERIOUS AND FASCINATING

The next day, Dorothy waited in the hotel lobby, and a man with "wiry black hair and bright blue eyes" and wearing a trench coat introduced himself as "Mr. Bradley." He asked questions about her knowledge of Santa Fe, background and skills. As Dorothy answered each question, Mr. Bradley "leaned in and stared intensely at her." Dorothy, captivated and mesmerized, accepted the job. "I never met a person with a magnetism that hit you so fast and so completely," she said. "I knew anything he was connected with would be alive."

Alive indeed. When Dorothy reported to work on her first day, "Mr. Bradley" would reveal his real identity as famed-scientist and leader of Project Y, J. Robert Oppenheimer.

TWO DECADES OF SERVICE

After World War II ended and her boss and friend Oppenheimer left the Lab, Dorothy stayed. She worked at the Lab for 20 years, retiring in 1963 when the Lab's Santa Fe office closed. Dorothy lived in Santa Fe until her death in 1985. ★

^ *Dorothy McKibbin taking telephone calls in her office at 109 East Palace, Santa Fe, New Mexico, in July 1958.*

NATIONAL SECURITY RESEARCH CENTER

WORKING TO SOLVE GLOBAL CHALLENGES, TOGETHER.

The NSRC is made up of highly trained, expert staff, who work alongside today's researchers to ensure they are connected to the greatest scientific minds of yesterday.

Collections Management Team

- Manages every aspect from discovery to preservation of the special collections;
- Curates one-of-a-kind materials made up of historical artifacts, atmospheric testing photographs, important historical documents, and more;
- Works with scientists to ensure they maximize a unique body of research conducted by history's top scientists.

Digitization Collections Team

- Specializes in digitizing Weapons Program Archives media;
- Implements new equipment and work processes to reduce the time to digitize various types of media;
- Works to digitize 10,000 videos (fastest deteriorating media in our collection) in just three years.

Research Librarian Team

- Assists researchers in finding documents and data;
- Trains and supports users of the NSRC's digital repositories;
- Offers guidance on legacy document classification;
- Develops indexing and metadata standards to make information more accessible.

Publications and Technology Teams

- Writes, illustrates and designs unclassified articles, periodicals, books, and other material for print and online;
- Produces classified journals for the Weapons Program;
- Develops and maintains technology solutions for the NSRC;
- Develops web platforms for classified and unclassified content.

HISTORY OF MILITARY PARTNERS

By John Moore, National Security Research Center Archivist-Historian

Gen. Leslie Groves, Director of the Manhattan Project

Col. Paul Tibbets Jr., pilot of the Enola Gay

Actor and former Staff Sergeant Charlton Heston

The Lab's partnership with the U.S. military started with the inception of the Manhattan Project.

During World War II, the code name for the world's most-secret project to build a nuclear weapon came from the U.S. Army Corps of Engineers' office located in New York.

Col. James Marshall established the "Manhattan Project" on the 18th floor of an office building in the burough of Manhattan, which was near physics laboratories in the city. Additionally, much of the U.S. stockpile of uranium ore was in warehouses nearby.

The Army soon decided that New York City was too crowded and too close to the coast. So, the laboratories at Oak Ridge, Hanford, and Los Alamos were established.

The Manhattan office was closed, but the name stuck.

MILITARY STAFF MEMBERS

In April 1943, people from diverse technical and scientific backgrounds began arriving in Los Alamos, including two Army groups known as the Special Engineering Detachment (SED) and the Women's Army Corps (WAC).

Monumental figures in the armed services have visited and worked at the Lab since then.

- William "Deak" Parsons, a Navy captain, worked on the assembly of the gun-type uranium bomb (Little Boy) and the transformation of bomb designs into combat weapons. Parsons also prepared for the bombs' deliveries by modifying aircraft and conducting field tests. He flew as the weaponeer on the Enola Gay and armed Little Boy in flight before it was deployed.
- The Lab's second director, Norris Bradbury, served in the Navy during the 1930s, with Lt. Commander Chester W. Nimitz signing his commission. (Nimitz was a decorated officer who commanded Allied air, land, and sea forces during WWII.)
- Col. Paul Tibbets Jr., the pilot of the Enola Gay, which deployed the world's first atomic bomb on Hiroshima, Japan, visited the Lab in 1945 as part of his preparation for his mission that would ultimately help end WWII.
- Val Fitch, who was drafted to be an Army engineer during his sophomore year of college, was stationed at Los Alamos. He worked on the successful detonation of the bomb named the Gadget in the Trinity test, as well as other bomb tests. He won the Nobel Prize in Physics in 1980, citing his work at Los Alamos as "the most significant occurrence in his education."
- Before he was a movie star, Staff Sgt. Charlton Heston was a gunner in the Air Force. He later visited Los Alamos in the 1980s to narrate several films for the Lab. ★

THE PLASTIC MAN WITH THE ANSWERS

By Madeline Whitacre, National Security Research Center Archivist-Historian

Beginning in the mid-1950s, to avoid using actual humans as test subjects, the Lab's health group turned to one of the Los Alamos superstars of health physics.

He was a subject in countless experiments and a favorite photo prop: Plastic Man.*

A WILLING TEST SUBJECT

In the early days of the Laboratory, not much was known about how different radioisotopes interacted with the human body. How accurate were in vivo measurements? How much radiation did the body absorb from different types of radiation sources?

Questions like these needed to be answered to keep people safe. That's where Plastic Man came in.

PART OF IMPORTANT WORK

One such example arose from the Rover program. During the 1950s and 1960s, the Lab was tasked with developing nuclear rockets for space exploration. One of the concerns was how astronauts might be affected when exposed to radiation from these rocket engines. So, the Lab's health group set up an experiment in which Plastic Man was placed in close proximity to a running reactor.

The Laboratory was also working to develop more-advanced and more-accurate means of taking in vivo measurements of radioactive isotopes at that time. These detectors were sensitive enough that they could be used to measure even the smallest amounts of radiation and were used to detect minute amounts of isotopes in actual people. However, Plastic Man was still useful for calibration and experimentation in these machines.

RETIRED LIFE

In time, technology advanced and Plastic Man was able to retire from the Lab. He found a new home in 1964 as a display at the Laboratory's science museum.

*The name "Plastic Man" is a bit misleading. There were actually a few different Plastic Men used by the Laboratory. ★

The National Security Research Center has the world's most-comprehensive collection of nuclear security materials related to the development, testing, and production of nuclear weapons, dating from World War II through today.

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HISTORIC SATELLITE PROGRAM TO MONITOR WEAPONS TESTING

By Danny Alcazar, National Security Research Center Archivist

We are now nearly 60 years passed the start of the Vela satellite program, which launched just one week after the Partial Test Ban Treaty went into effect in October 1963. The ban prohibited all nuclear weapons testing except those conducted underground. The initial Vela satellite program – Vela Hotel – was primarily developed at the Lab to monitor the Earth's atmosphere and space environment for nuclear tests. In the end, the program furthered scientists' understanding of how to map the universe and expanded methods of radiation measurement to discover and identify natural events, ranging from massive lightning bolts to supernovas (the exploding death of stars).

WHAT'S VELA?

Project Vela was a series of reconnaissance satellites developed by the Laboratory under the supervision of the United States Air Force. The project's mission was to detect radiation from clandestine nuclear tests in the atmosphere and in space using spacecraft orbiting some 60,000 miles above Earth. The Vela satellites were solar powered and had sensors designed to detect unusual radiation bursts produced by sneak nuclear explosions and extraterrestrial events like solar flares and solar storms. They also had instruments to measure the properties of the space environment and resulting backgrounds produced in the radiation instruments. The Vela project began in 1959 as a low-budget research program promoted by the Defense Advanced Research Projects Agency. Soon after, the United States, Great Britain, and the Soviet Union signed the test ban treaty, and the Vela program was a way for the United States to ensure the ban was – or was not – being followed.

DETECTING RARE SOURCES

The Lab's Physics Division was given the task of first determining what types of signals would be transmitted through space by a nuclear detonation and then designing and building instruments capable of detecting them. The first pair of Vela Hotel satellites launched on October 17, 1963. These sentinels were each equipped with sensors that could detect gamma rays, x-rays, and neutrons from enormous blasts, including rare sources.

One example of the latter was a mysterious blast on April 2, 1978, on Bell Island, off the southeastern coast of Newfoundland. Some locals thought the blast was caused by the collapse of an iron mine or maybe even a secret weapons test conducted by the U.S. military. Another hypothesis was a rare form of lightning called a superbolt, which is stronger and lasts longer than normal lightning.

Los Alamos scientists Robert Freyman and John Warren, who'd been tracking superbolts over the East Coast, investigated the Bell Island incident. With data from Vela in hand, they concluded that the evidence was consistent with a superbolt being a possible cause for the boom. B. N. Turman, in his article in the *Journal of Geophysical Research* documented that the Vela satellites were used in the detection and study of flashes associated with lightning superbolts, further supporting the notion that Warren and Freyman had been monitoring superbolt activity. According to the research:

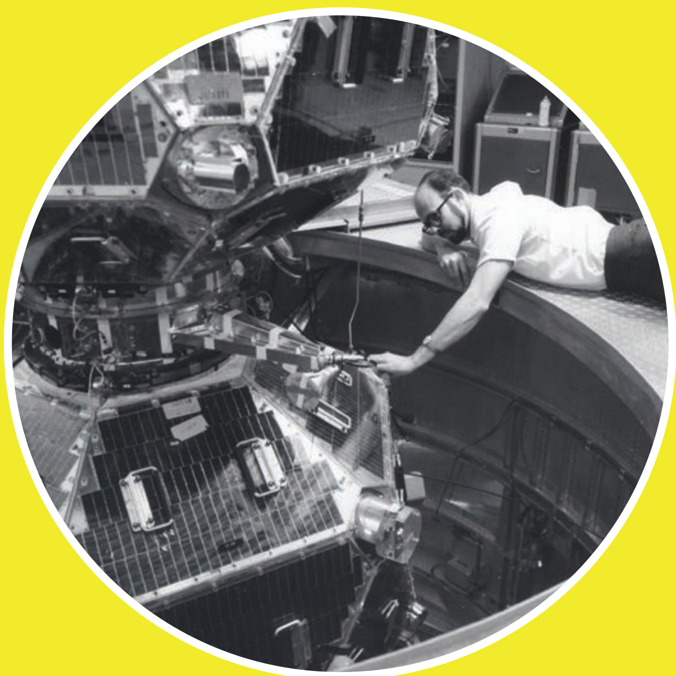
"The Vela satellites carry optical sensors for the detection of terrestrial nuclear explosions. Four Vela satellites keep the entire Earth under constant surveillance. In addition to nuclear explosions, these satellites register many intense lightning flashes. Some of the flashes are over 100 times more brilliant than average. Only about five of these superbolts occur for every 10 million flashes registered. . . .This evidence ruled out the possibility of a U.S. electromagnetic pulse weapon test as their research revealed that a lightning superbolt was a possible cause."

BENEFITS BEYOND WEAPONS

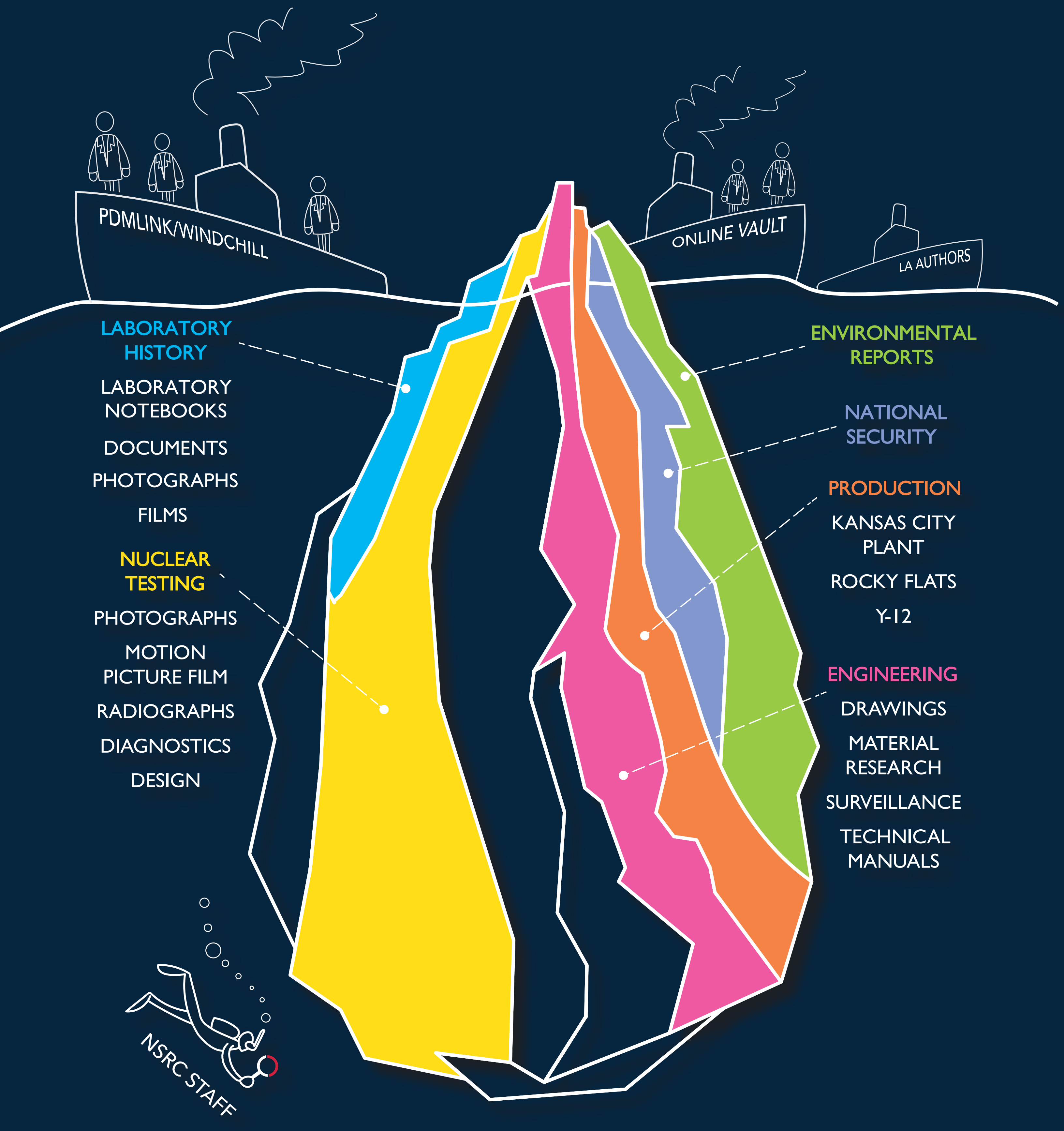
The Velas kept Earth and nearby space under constant surveillance, looking for any sign of nuclear weapon detonations, but their discovery of gamma-ray bursts (signatures of stellar death and black holes) from beyond our solar system has helped scientists understand how they originate from rare supernova explosions in distant galaxies.

Several years after the first Vela satellite twin crafts were launched, more technically advanced versions of the satellite were developed.

These pioneering scientific discoveries and radiation detection capabilities have enabled scientists to learn about meteorological and cosmological rarities, venture on successful scientific space missions to our solar system, map the universe and protect our nation. ★



^ *At right and above: Lab staff work on the Vela satellite program, which was primarily developed at Los Alamos to monitor the atmosphere and outer space for tests. The program furthered scientists' understanding of how to map the universe and expanded methods of radiation measurement to identify objects in deep space.*



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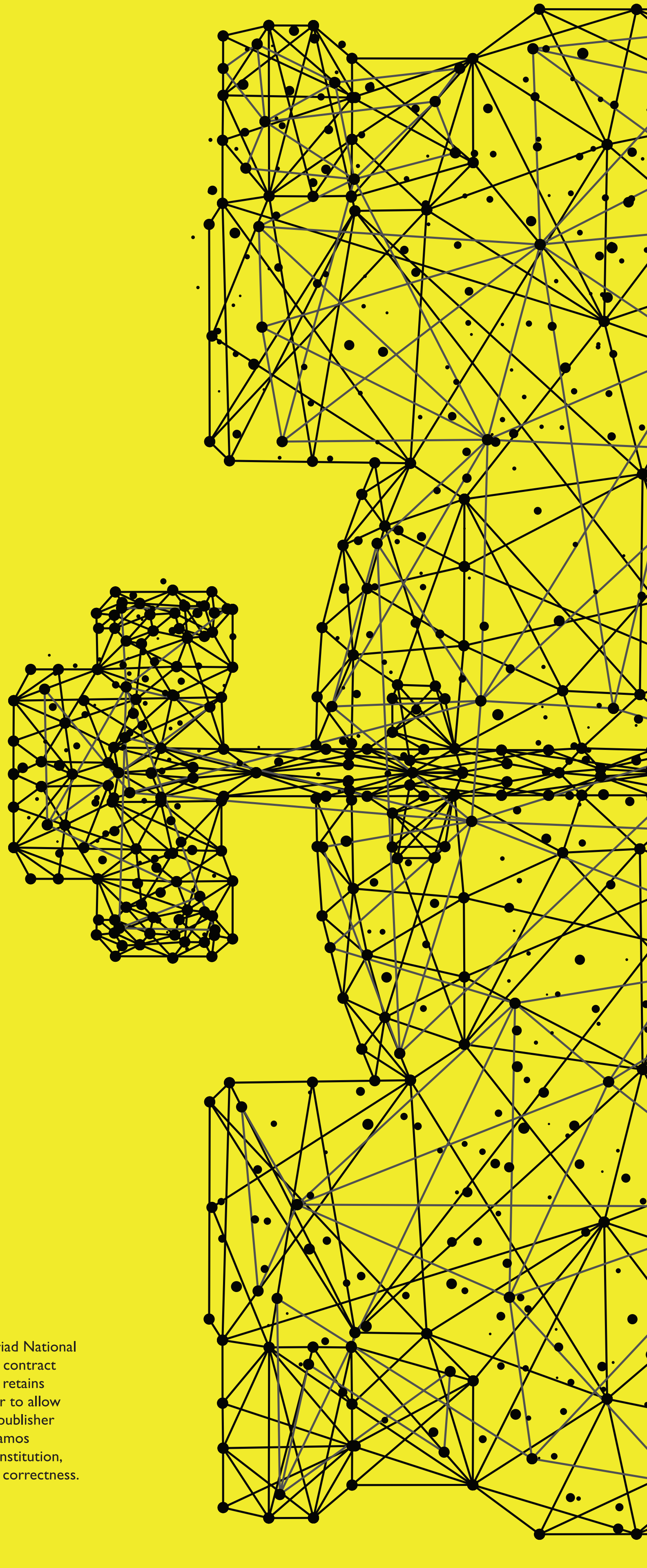

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