

## **History of Los Alamos**

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Los Alamos, New Mexico, is one of the most important locations in scientific history. This may be surprising because it is one of the most desolate places in the southwest United States, also, Latin America. This location provided a classroom, a laboratory, a collaborative community, and resources to end the deadliest time in recorded human history. “Some 75 million people died in World War II, including about 20 million military personnel and 40 million civilians, many of whom died because of deliberate genocide, massacres, mass bombings, disease, and starvation”(History of Western Civilization II). It took a bomb, unlike all others created to mass destruction, to end the killing across the globe. Los Alamos provided a serene environment to create the engineer’s dream and the enemy’s nightmare.

The idea of the use of nuclear weapons quickly sparked a liking for these hostile weapons. It began with three chemists in a lab in Berlin discovering that using nuclear energy to split uranium atoms can create extremely devastating consequences. This newly found possibility became an international bomb development race, kicked into high gear rapidly due to the escalating and devastating World War II. Nuclear weapons were hoped to spread to countries that did not already have them or did not possess the necessary materials to produce them. This became known as nuclear proliferation. Although this proposed a possible advantage to less powerful countries across the globe, it also posed a threat to peace globally. There was no longer an imbalance of power, and although this sounds like a favorable idea, it allowed countries like Germany to even the score. At that time, this could have been detrimental to efforts to restrict German power. The threat of nuclear weapons getting into the wrong hands was not only unease towards the major peacekeeping nations, including the United States, but also counterproductive

towards global disarmament efforts. The United States knew that in order to stop these potential threats, they needed to escalate their efforts and be the first to use nuclear weapons. By being the first, the United States could also limit their use of nuclear weapons. Los Alamos became the home of this endeavor.

Los Alamos is a north-central city on the Pajarito Plateau with high elevations and fairly mild temperatures compared to other cities. Los Alamos is known for having four mild seasons and is surrounded by beautiful big pine trees, national forests and parks, and other federal lands. These beautiful lands were occupied by both ancestral and native Pueblo people. The Pueblo people utilized the land's volcanic tuff to build dwellings on the sides of canyons and villages on top of the mesas. It is here where they were able to farm the rich land. Although the Pueblos did migrate to and from the area, in the 1940s, they were denied access to their native lands and traditions. Their lands were now the location and region for the Manhattan Project. Yet, "Local Pueblo communities contributed to the success of the Manhattan Project, and tribal members continue to be an integral part of the Los Alamos National Laboratory today"(Wheeler. 2024). With limited access, locals were still able to contribute as laborers in jobs such as janitors, support staff, and waste disposal while also providing cultural enrichment to local traditions and customs.

On the other hand, during its development of testing areas, local ranchers and farmers were evicted by the government due to eminent domain. Those who lived nearby and who were not forced from their homes still suffered the consequences of the nearby bomb testing. "There were, in fact, dozens of families within 20 miles, largely poor families of ranchers and farmers, many Hispanic and Indigenous, who unwittingly went about their daily lives in the first fallout of the atomic age. Now, those who were infants and children downwind of the detonation of the

‘Gadget’—a code name for the plutonium bomb used in the Trinity test—are nearing the end of a decades-long battle to be recognized and compensated for generations of illness they trace to exposure from radioactive fallout.” The bomb testing annihilated the landscape and contaminated the inhabitants, proving its destruction and potential success in ending the war.

In 1940, the entire state of New Mexico had 530,000 people living on its land. In 1942, two individuals scouted the land and determined it was perfect for destruction, and the government began evicting inhabitants from potential test sites. From ranchers to Indigenous people, families were uprooted. The land was acquired during the US-Mexico War (Treaty of Guadalupe Hidalgo) and then later commandeered by the government in the name of war for \$12 per acre. “In 1942, the U.S. Army gave 32 Hispano families on the Pajarito Plateau 48 hours to leave their homes and land, in some cases at gunpoint, to build the lab that would create the world's first atomic bombs, according to relatives of those removed and a former lab employee”(Reuters).

In comparison, other non-Hispanic families received adequate compensation for their land, and community amenities such as hockey rinks and parks. “After denying an offer by then-Energy Secretary and former New Mexico Governor Bill Richardson for nine acres of land to be used to build a monument to the homesteaders in 1999, numerous families filed a class-action lawsuit under the name of Pajarito Plateau Homesteaders, Inc., representing thirty-four of the families who were evicted from their ranches atop the Pajarito Plateau without due process. Thirty-two Nuevomexicano family trees were filled with names such as Durán, García, Gómez, Quintána, Gonzáles, Luján, Montoya, Romero, Roybál, Serna, and Vigil.” Latin American families were the domestic victims of the development of the atomic bomb and its testing. Nearby communities saw an increase in cancer cases and other illnesses related to

overexposure to radiation. The majority of these victims were Nuevomexicanos. These “Downwinders” dealt with shattered windows in their homes, black ash soiling their laundry, and radiation filth covering their towns and villages. “It was on our roofs, our gardens, milk cows, rabbits, pigs, turkeys, and chickens” (Herrera, “First-Hand Account”). Little did the Nuevomexicanos living downwind of that bomb blast know that generations of Nuevomexicanos would live with the consequences from that day.”

Meanwhile, in Los Alamos, life needed to resemble some normalcy for those relocating to the area. As the nation's masterminds from Cornell, Princeton, MIT, University of Chicago, and Berkley eagerly traveled to join the new project, they brought their families and children. Life had to appear pleasant and peaceful. “Husbands and wives and their children ate family meals, enjoyed hikes throughout the area, and attended parties which were often hosted on weekends at scientists’ residences in the gated facility.” People arrived without knowing what exactly they would be working on, where they would be living, and what they would do to fill their lives in their new town. Secrecy was imperative at every level (work, home, life). Women were given clerical jobs, children continued to go to school, and children were born in local hospitals. There was skiing and ice skating in the wintertime, and fishing, hiking, and camping in the summer. Los Alamos also provided the perfect weather for weapons testing.

As the project escalated, tensions did as well. Restrictions for workers increased, and communication, time, and way of life then limited to also prevent the sharing of any information regarding the Manhattan Project. Workers were put under rules such as not being able to travel more than 100 miles from the project and no personal contact with any relatives. Any contact that did happen had to be reported or supervised. These brutal restrictions did stop inadvertently

discussing the project, but also unintentionally became a motivator for workers in the project to finish in order to return to their regular way of life.

Ironically, the land's beauty, which attracted the scientists to the region, also inspired them to design destruction. "Several sites in the interior western United States were considered, but it was not until J. Robert Oppenheimer, the scientific director of the bomb laboratory, suggested Los Alamos that the site was chosen..... He had enjoyed summers in Los Alamos as a youth and believed that the beautiful location would help the weapons team endure the arduous challenge ahead." In addition, the isolation gave a perfect disguise to a secret government laboratory for the research and development of weapons, specifically bombs. The serenity gave scientists a perfect location for the scientists to rest, relax, and share ideas to engineer destruction. It is in Los Alamos, where the atomic bomb was masterminded and developed. "Oppenheimer recalled: 'We knew the world would not be the same. A few people laughed, a few people cried, most people were silent.'" In the peaceful landscape, humans witnessed destruction that had never been seen before.

Oppenheimer may not have been the first person to reside in Los Alamos, but he was the primary reason why the laboratory and the testing sites were established there. He was born on April 22, 1904, to his non-practicing Jewish immigrant parents from Prussia. He was raised in a wealthy home in New York City and later went to Harvard and Cambridge, and then the University of Göttingen in Germany to pursue his PhD in Physics. He later lectured at the University of California and California Institute of Technology. His intellect, education, and strong presence and influence gave him the opportunity to be recruited to a top-secret government project, later called the Manhattan Project, developing the atomic bomb. Yet, he would often be reminded of his Jewish roots.

The treatment of the Jews in Germany infuriated Oppenheimer. He donated portions of his salary to help fund German physicists escaping Nazi Germany. His efforts seemed futile, which motivated him to do more. There was a race to develop weapons worldwide, specifically with Germany. “A significant number of the Manhattan Project’s key scientists were Jewish refugees from Europe, including Hans Bethe, Otto Frisch, John von Neumann, James Franck, Edward Teller, Klaus Fuchs, and Rudolf Peierls.” He was now working alongside like-minded brilliant scientists and those with the same heritage.

Mass destruction seemed to be the only way to win World War II. Land and sea battles were failing, and hope was fading with over 75 million people dead, both military personnel and civilians worldwide. But, new weapons with advanced technology renewed hope. “...their goal was destruction and spectacle, to show the Japanese, the Soviets, and the whole world, what the potential of this new weapon was.” In essence, those with the heaviest hand, would have the last word. “Upon becoming president, Harry Truman learned of the Manhattan Project, a secret scientific effort to create an atomic bomb. After a successful test of the weapon, Truman issued the Potsdam Declaration demanding the unconditional surrender of the Japanese government, warning of ‘prompt and utter destruction.’ Eleven days later, on August 6, 1945, having received no reply, an American bomber called the Enola Gay left the Tinian Island in route toward Japan.”

The atomic bombs that made impact on Japanese soil killed many, but only a mere fraction compared to the rest of the world. “Estimates place the number of dead by the end of December 1945, when the acute effects of radiation poisoning had largely subsided, at roughly 140,000.” However, all eyes around the world witnessed what the Manhattan Project created and the power the United States now possessed. The “prompt and utter destruction” was delivered quickly, expeditiously, and was undefendable. President Truman kept his promise.

Before the bombs dropped on Japan, countries around the world were competing on a grand scale to reach scientific success. It was their hope to achieve peace, financial gain, power and end World War II. This not only motivated countries, but individuals as well. The Soviet Union was eager to be a world leader and gain respect on the world stage. “As part of Operation Enormoz (“enormous”), Soviet agents recruited American and British spies who were committed communists, including several scientists at the Los Alamos laboratory.” The extent of the espionage and the number of spies would not be known until after the war. Britain and the United States joined forces to decipher codes to identify plans and individuals who wanted to benefit from the war themselves. Whether promised pay or position or out of loyalty to their country, spies helped the Soviet Union excel in their scientific accomplishments with the creation of a Soviet Union atomic bomb. Some notable World War II spies who worked with the Soviet Union include John Cairncross (British), Melita Norwood (British), Klaus Fuchs (German/British), David Greenglass (American), Russell McNutt (American), Clarence Hiskey (American), Theodore Hall (American), and Oscar Seborer (American). Several of these individuals were working in New Mexico on the Manhattan Project. Klaus Fuchs later confessed in 1950 to providing intelligence to the Soviets, which accelerated their atomic bomb progress. Douglas Greenglass also worked on the Manhattan Project as a US Army Sergeant and machinist. He was “Recruited to spy for the Soviets by his brother-in-law, Julius Rosenberg, Greenglass passed information to the Soviets in mid-1945 that included a hand-drawn sketch and notes describing the implosion-type bomb.” His sister, Ethel Rosenberg, was implicated by him during his 1950 confession. Clarence Hiskey was another huge influence on the Manhattan Project. He later passed information to the Soviet Union GRU intelligence department. Theodore Hall “.... the youngest physicist on the Manhattan Project, was the long-suspected third spy (after



Fuchs and Greenglass) at Los Alamos. Codenamed 'Mlad,' Hall had reached out to the Soviets in late 1944 and soon after provided them with a key update on the development of the plutonium bomb." From scientists to couriers, chemists to machinists, each layer of those involved with the Manhattan Project were necessary but also exposed the project to espionage and security risks. Despite the time consuming process to invent, design, create, and test the atomic bomb, the United States won the race in developing the catastrophic weapon of mass destruction. This also catapulted the United States in being a world leader.

The atomic bomb's destructive design begins with its great explosive power generated by the splitting of nuclei of plutonium or uranium. Through this fission, a sudden release of energy is created, spreading thermal energy and gamma rays. "This series of rapidly multiplying fissions culminates in a chain reaction in which nearly all the fissionable material is consumed, in the process generating the explosion of what is known as an atomic bomb." Relative to the material used in the bomb, power in exponential numbers is released. "The detonation of an atomic bomb releases enormous amounts of thermal energy, or heat, achieving temperatures of several million degrees in the exploding bomb itself. This thermal energy creates a large fireball, the heat of which can ignite ground fires that can incinerate an entire small city." Not only is a fireball created, but radioactive contaminants can be lethal for weeks after detonation. Severe illnesses such as cancer can also result from exposure to the radiation. The atomic bomb is a death machine in every shape and form.

After the development of the atomic bomb, testing was necessary. Smaller tests leading up to the larger tests involved live rats with wires attached to them with battery clips. These experiments gauged the radioactive exposure and the effects of the bomb exposure on life. On July 16, 1945, the first official atomic bomb test was called the Trinity Test, located just 210

miles south of the safe and serene laboratory in Los Alamos. “When, two months later, the first atomic bomb was finally tested, it was done over the objections of doctors and a meteorologist who warned the weather that morning was likely to spread fallout far and wide over New Mexico’s civilian population. ‘Right in the middle of a period of thunderstorm,’ the meteorologist complained in his journal of the scheduled test, ‘What son-of-a-bitch could have done this?’” Many lives were put at risk with the uncertainty of the testing near cities and towns on our home soil.

“The success of the Trinity Test proved that an implosion-type, plutonium-fueled nuclear weapon could work. On August 9, 1945, three days after the uranium-fueled Little Boy atomic bomb detonated over Hiroshima, Japan, Fat Man, the plutonium-fueled implosion-type atomic weapon developed at Los Alamos and based on the success of the Gadget, exploded over Nagasaki.” The atomic bombs dropped on Hiroshima and Nagasaki in Japan killed over 125,000 people and jolted the political globe. “Winston Churchill, President Truman, and Stalin met at the Potsdam conference in July 1945. Their terms for ending the war with Japan hinged on the nation's acceptance of unconditional surrender.” Once Japan surrendered, the war was over. This remains the only time in history to date when nuclear weapons were used in war times. The mass destruction, death toll, fear, and chaos Hiroshima and Nagasaki experienced was observed by the world. Little did we know this would be just the start of greater concerns.

After World War II, “Seven years later an even more destructive nuclear bomb was built - the hydrogen bomb.” First discovered in 1938 in Germany by two chemists using fission and fusion, therefore, binding the atoms. Fission had to be first in order to the hydrogen bomb to be developed and to work. For the fission reaction, Plutonium was used for fuel in the first atomic bomb detonated and used on Nagasaki. The second bomb used uranium for fuel for the same

purpose. It was discovered that uranium was easier to use and less complex than plutonium. However, both bomb designs and the process to create them were both very complex in nature. In the interest of war and the race for technology to destroy, the hydrogen bomb was born. “The first stage consists of a fission bomb with a core or ‘pit’ made of plutonium or uranium, surrounded by conventional explosives, much like the original atomic bombs. But this bomb within a bomb is ‘boosted’ by adding hydrogen gas to the center of the core, making the fission explosion more powerful. That enormous power is essential to igniting fusion in the second stage”(Business Insider). In addition to this stage, x-rays ignite the fuel, and tritium is created during the reaction and fuses with deuterium from the lithium deuteride, which releases neutrons and energy. The heat creates more heat, which creates more heat and more fusion reactions occur. Hydrogen bombs are more destructive, up to one thousand more, than the atomic bombs that were dropped on Japan by the United States during World War II. “The Little Boy atomic bomb dropped over Hiroshima contained 140 pounds of uranium and produced a blast of 15 kt. The “Fat Man” bomb dropped over Nagasaki contained about 13 pounds of plutonium to produce a 21 kt blast.” Little Boy was about 15,000 kilotons, whereas an H-bomb would be about 15,000,000 kilotons. “The largest US thermonuclear bomb ever tested, Castle Bravo, produced a 15 Mt explosion — a whopping 1,000 times more powerful than the atomic bomb dropped over Hiroshima”(Washington Post). Not only are they more powerful, but the technology has made it into the hands of Russia, France, Britain, China, and the United States.

The use of nuclear weapons sparked a liking towards these hostile weapons. Nuclear weapons began to spread to countries that did not already have them or did not possess the necessary materials to produce them. This became known as nuclear proliferation. Although this proposed a possible advantage to less powerful countries across the globe, it also posed a threat

to peace globally. There was no longer an imbalance of power, and although this sounds like a favorable idea, it allowed countries like Germany to be able to even the score, which at the time, could have been detrimental to efforts to restrict German power. The threat of nuclear weapons getting into the wrong hands was not only an unease towards the major peacekeeping nations, including the United States but also counterproductive towards global disarmament efforts. “And the most powerful thermonuclear bomb ever — the Tsar Bomb, detonated by the Soviet Union — was 50 Mt.”

While the atomic bomb may have ended World War II, it also started the Cold War. “The term was first used by the English writer George Orwell in an article published in 1945 to refer to what he predicted would be a nuclear stalemate between ‘two or three monstrous super-states, each possessed of a weapon by which millions of people can be wiped out in a few seconds.’ It was first used in the United States by the American financier and presidential adviser Bernard Baruch in a speech at the State House in Columbia, South Carolina, in 1947.” This Cold War involved the United States of America and the Soviet Union. This was an era of other nations striving to develop larger weapons, missiles, and bombs. Nations were at a standstill to defend their nation and command power and control. “The two superpowers soon signed the Nuclear Test-Ban Treaty of 1963, which banned above-ground nuclear weapons testing. But the crisis also hardened the Soviets’ determination never again to be humiliated by their military inferiority, and they began a buildup of both conventional and strategic forces that the United States was forced to match for the next 25 years.” A battle of ego and pride spanned over decades. In the 1970s and 1980s, “By and large, the Cold War was brought to an end by people in the Soviet bloc demanding a relaxation or an end to socialist policies. The pressures they applied undermined and eroded political authority their respective nations.” The crumble of the

USSR also led other communist countries to relax as the threat of the USSR faded. While many wish to take credit for ending the Cold War (Ronald Reagan, Margaret Thatcher, Mikhail Gorbachev), many “believed communism was defeated by its own false promises: it was an unsustainable economic system that had collapsed from within”(Alphahistory, 2024). Regardless of who or why, the world reaction to the end of the Cold War was largely unified. Hope for stability, celebration for freedom, optimism for economic possibilities, and anticipation for international opportunities increased.

The Manhattan Project, Oppenheimer, the laboratories and the world history that originated on the soil of Los Alamos, New Mexico will live in infamy. After World War II, and in 1945, Oppenheimer resigned. His replacement, Norris Bradbury, argued to keep the facility to further develop weapons in hopes that the atomic bomb would never be used again. Eventually, morale decreased, policies changed, and the government wanted to allocate the laboratory research to civil organizations. Eventually, the University of California decided to continue research at the original scientific laboratories. “... in 1957 the security gates came down and Los Alamos became an open city. Norris Bradbury's 25-year tenure as director came to an end in 1970.” Today, Los Alamos National Laboratory is privately operated with a focus on energy advancements and environmental management. According to their website, their research focus areas include materials and concepts for clean energy, science for renewable energy sources, superconducting cables, energy storage, and fuel cells. The Los Alamos National Laboratory boasts of 70 awards received in 2023, and 23 cultural resource projects supported. “As of September 30, 2023, the Los Alamos National Laboratory (LANL) has a total workforce of 17,438, which includes laboratory employees, supplemental effort contractors, and the guard force...”(Housing Demand).

In 1990 and decades following the nuclear bomb testing in the area, lawmakers passed the US Radiation Exposure and Compensation Act (RECA), amended in 2000. As a result of this act, over \$2 billion dollars has been paid to victims of the downwind radiation. This act was scheduled to “sunset” in 2024. However, Senate Bill 3853 passed “A bill to extend the period for filing claims under the Radiation Exposure Compensation Act and to provide for compensation under such Act for claims relating to Manhattan Project waste, and to improve compensation for workers involved in uranium mining.” EEOICPA, or Energy Employees Occupational Illness Compensation Program Act, was signed on October 30, 2000 by President Bill Clinton and passed in Congress in 2000. Both EEOICPA and RECA are made aware to the local public and energy workers on the United Energy Workers Healthcare website. The United Energy Workers Healthcare provides no cost healthcare for those impacted by illness resulting from local laboratories. “If the former workers of Los Alamos National Laboratory meet specific requirements, they may be eligible for health benefits and lump-sum payments through the program”(UEW Healthcare). RECA was later amended and extended to ensure those impacted by the laboratories hazardous waste and testing are given medical care.

Native Pueblo lands are surveyed today to learn more about the history and culture of it’s native people. “In the decades since, efforts to involve stakeholders, such as Puebloan descendant communities, have increased. Livesay, Linford, and other members of the Laboratory’s Environmental Stewardship group often serve as the conduit to communicate with Lab leadership, external groups, and state and federal agencies.” Archeological research in the area gives information on the ancient land of the native Pueblo people from ancient burial grounds to artifacts of their culture. Due to the building of laboratories and work sites, much has

been lost. However, today in Los Alamos, New Mexico, steps are taken to learn about damages made in order to educate the future and hopefully, make amends with the past.

The city itself is growing as well. “In 2022, Los Alamos, NM had a population of 13.5k people with a median age of 41.3 and a median household income of \$130,342. Between 2021 and 2022 the population of Los Alamos, NM grew from 13,270 to 13,460, a 1.43% increase and its median household income grew from \$118,293 to \$130,342, a 10.2% increase.” A city rich with history, war and loss is still alive and growing today.

The scenic and remote areas of a quaint small town in New Mexico were chosen to give birth to mass destruction and death. This Latin American town, its heritage, and landscape gave both security and secrecy to protect a project to end a war happening all over the world. The Manhattan Project would essentially cause suffering to end suffering and would be felt both on domestic and foreign soil. Downwind New Mexico residents were made ill, and even died in the name of science. Other residents were displaced and robbed of their land and homes in the name of war and peace. During the atomic bomb invention and development process, scientific research and concept creation gave new ideas which were growing. Designs were created and stolen, relationships were collaborative and betrayed, hope was restored and shattered, and power was taken and awarded. Scientists, engineers, researchers, and machinists were educated and prepared to accept a task they had no comprehension of. The sheer magnitude of the development process and the resulting atomic bomb effects would leave most people speechless. These people would include the scientist who witnessed the testing of the bomb, the victims in Japan, and newspaper readers around the globe. Once the bombs were dropped on Japan, the world changed. Today, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) aims to “... prevent the spread of nuclear weapons and weapons technology, to promote cooperation in

the peaceful uses of nuclear energy and to further the goal of achieving nuclear disarmament and general and complete disarmament” (Office of Disarmament Affairs). The effects of the nuclear bomb are collectively recognized to be unnecessary and a war crime. Lessons were learned as a result of the devastation caused in Japan at the hand of the United States in 1945. Since July 1, 1968, 191 countries are now party to the NPT. “Fifty-nine countries signed the NPT when it opened for signature; the treaty now has 191 parties. Yet despite that nearly universal agreement, the number of countries with nuclear weapons has grown.” However, countries are working together today to collaborate support peaceful nuclear energy use, such as clean alternative energy sources. In addition, “every five years, the parties meet to discuss how to achieve the treaty’s goals of nonproliferation and eventual disarmament, a practice that gives this foundational agreement fresh air and room to grow”(Crf). As we look at the past in how nuclear energy was developed for devastation, there is hope that the same technology can promote a peaceful and stable world for all.



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