

Deirdre Sweeney

Professor Julia Bursten

Space Time and Matter from Antiquities to the 20th Century

22 April 2014

The Manhattan Project and Alsos Mission and the Consequences It Had on the Scientific
Community and Society

In this paper, I will explain what the purpose of the Manhattan Project was during World War II. I will explain the two major categories of atomic bombs created, namely gun-type bombs and implosion-type bombs and I will name the major breakthroughs these had. I will then focus on the Alsos Mission and the purpose of the Alsos Mission within the Manhattan Project. I will explain how the Alsos Mission was in charge of gaining information, materials, and scientists from the German and Axis side, and how it enhanced the Manhattan Project. I will go through each of the three phases of the Alsos Missions: Italy, France, and Germany and explain the major accomplishments and failures from each phase. I will then continue by explaining the social and scientific consequences of the Alsos Mission and the Manhattan Project in general. I will finish by summing up the important acts and projects involved in nuclear energy technologies after the War.

During World War II, the scientific community had just started exploring nuclear power. The United States, allied with Great Britain and Canada, decided to put together a team to explore the possibility of nuclear weapons as a form of weaponry for the war. The concept of an atomic bomb had just started to become possible through the scientific discoveries within the nuclear engineering field. And with the explicit direction of Albert

Einstein, the Manhattan Project was created to research and develop the production of the first atomic bombs. The Manhattan Project was an enormous undertaking that required the efforts of many of the world's most brilliant intellectuals. These ranged from physicists, mathematicians, and engineers who were all hired to design, build, and test the world's first atomic weapon. Although not all scientists were directly involved in the Manhattan Project, a lot of the work they did were indirectly invaluable to the contributions of the project. These major names include, but are not limited to Albert Einstein, Niels Bohr, Enrico Fermi, Frank Oppenheimer, J Robert Oppenheimer, and many more. (The Scientists Behind the Manhattan Project)

The purpose of the Manhattan Project, as stated before, was to research and develop the production of the first atomic bomb. It began modestly in 1939, but didn't start to grow until 1942 when Major General Lee Jones of the US Army Corps of Engineers took over direction. (Manhattan Project) This lined up well with a breakthrough that Fermi had in December 1941. He led a group of physicists to produce the first controlled nuclear chain reaction at the University of Chicago. (The Manhattan Project) In the end, it provided jobs to 130,000 US citizens and cost the government about \$2 billion (a sum of approximately \$26 billion in present day).

Through the Manhattan Project, two different types of atomic bombs were created. The initial creation was a gun-type fission weapon that used Uranium-235 encased in Plutonium. This proved to be impractical to use, however, so scientists expanded their theory and built a more complex implosion-type weapon that was developed at the Los Alamos branch of the Manhattan Project. The first atomic bomb ever tested was an implosion-bomb in New Mexico in July 1945. A gun-type weapon,

Little Boy, and an implosion-type weapon, Fat Boy were used in the bombings of Hiroshima and Nagasaki. These were directly related to the surrender of Japan and the end of World War II. (Manhattan Project)

The Manhattan Project was also charged with gaining information on the German Nuclear Energy Project. This branch of the Manhattan Project was declared Operation Alsos and was created after we invaded Italy in September 1943. Through the Alsos Mission, Manhattan Project personnel served in Europe, typically close to the enemy lines but even sometimes behind the lines, gathering intelligence and documents on nuclear materials and methods and rounding up German scientists. It was not restricted to nuclear weapons however. They also collected information on chemical and biological weapons and their distribution system. Colonel Boris Pash, a former Manhattan Project security officer, was put in charge of this Operation and Samuel Goudsmit was the scientific leader. This mission was fairly successful. They managed to find and remove many of the German scientists and a substantial portion of their records and materials. They captured most of the German research personnel, including Otto Hahn, Max von Laue, Werner Heisenberg, and Carl Frederich von Weizsacker. (Manhattan Project)

Operation Alsos was split into three different phases. Phase 1 took place in Italy, Phase 2 was in France, and Phase 3 was in Germany. The objectives of Alsos in Italy were to obtain advanced information regarding scientific developments in enemy research and to secure all important personnel, laboratories, and scientific information immediately pending their availability. This phase started in Algiers at the end of 1943. It was not particularly successful. They were not able to obtain conclusive information

about Germany's experiments and progress. But they did manage to find several smaller scientific discoveries that were helpful to the Allies.

In August 1944, The Alsos Mission had grown in size and moved to occupied France where they approached Paris from Reims. In fact, Colonel Pash's Jeep was the second vehicle to enter Paris. (History – The Alsos Missions of the Manhattan Project)

One of the primary objectives of this mission was to breach the College of France in Paris where Frederic Joliot-Curie's laboratory was located. Once Joliot was captured, he willingly gave us information on his scientific experiments and those of his companions. He confirmed that Germany had made little progress toward harnessing atomic energy. And although some thought he wasn't to be trusted, he did give us several important names of German scientists, including Professor Schumann (research on uranium), Dr. Diebner (nuclear physicist), Professor Bothe (nuclear experimentalist), and others. He did not, however, give us the location of three of the most prominent German scientists, Werner Heisenberg, Otto Hahn, and Carl von Weizsacker. (History – The Alsos Missions of the Manhattan Project)

In February 1945, the Alsos mission phase 3 started and we entered Germany. With this mission, one of the primary operations was to make sure none of the German scientists or nuclear materials got into the hands of the Russians. This became very problematic especially when one of the key German facilities was located squarely in the middle of the Russian zone. Because it was impossible to reach the facility first, General Groves made a request to destroy the base. On March 15th 1945, an Air Force went in and dropped high explosives on the plant. It was destroyed.

One of the sub-operations within Phase 3 of the Alsos Mission was Operation Harborage. The purpose of this operation was to ensure that a few suspected nuclear research facilities within Germany were taken into American hands when France fell to the Allies. This became essential when the French were given a “zone of occupation” in Germany that was surrounding these nuclear research facilities. General Groves stated on this topic,

“As I saw it, there could be no question but that American troops must be the first to arrive at this vital installation, for it was of the utmost importance to the United States that we control the entire area that contained the German atomic energy activities... I was forced to initiate some drastic measures to accomplish our purpose.” (History – The ALSOS Missions of the Manhattan Project)

These “drastic measures” mentioned were to have a sizable force, perhaps at the Corps level, cut diagonally in front of the advancing French army and seize the area long enough to capture the scientists wanted, seize and remove all available records, and destroy any remaining facilities. This operation was initiated in April 1945 and Hechingen was captured on April 24th. From this operation, we managed to seize a large atomic physics laboratory. We also captured several scientists including Otto Hahn, Carl Von Weizsacker, and Max von Laue. We gained intelligence that Heisenberg and Gerlach were possibly in Munich or the Bavarian Alps. The Alsos mission was officially disbanded on October 15th, 1945. (History – The ALSOS Missions of the Manhattan Project)

Although the mission itself was successful, it did not contribute much to the Allied defeat of Nazi Germany. This is because the German nuclear and biological weaponry programs were much smaller and less threatening than originally anticipated. It was underfunded and disorganized and therefore was much further behind than the Allies efforts. This being said, the Alsos Mission did play a small part in the subsequent scientific and technological developments that characterized and transformed the world and society after the war.

The Manhattan Project as a whole had a lot more of an impact during and after the war. The dropping of Little Boy and Fat Boy in Japan has caused many negative consequences to the surrounding areas. The area in Japan where the bombs were dropped is uninhabitable. The bombs caused a number of radiation poisonings in the adjacent neighborhoods through the acid rain and the surrounding water. There is also some evidence of the radiation poisoning causing the passing of Leukemia to offspring. Not all of the consequences of the Manhattan Project were negative, however. The creation of the atomic bomb allowed scientists to discover how to harness the power of nuclear energy. From this we were able to build nuclear power plants and use the energy as an effective alternative to traditional power plants. The technology used in atomic bombs also helped further the medical community. This technology helped lead to the development of CAT scans and chemotherapy. (The Manhattan Project) It also lead to medical breakthroughs such as the treatment of Parkinson's Disease, the preservation of cells for transfusion, and the introduction of small accelerators to produce short-lived radioisotopes of immediate use in patients. (The Manhattan Project – It's Story)

After World War II, the United States Atomic Energy Commission was established. They were in charge of fostering and controlling the development of atomic science and technology. They declared that atomic energy should be employed in the Nation's defense, to promote world peace, to improve public welfare, and to strengthen free competition in private enterprise. President Truman signed the Atomic Energy Act in August 1946. In 1953, President Eisenhower proposed the Atoms-for-Peace act that stated that all nuclear powers contribute their stockpiles of uranium and other materials to an international atomic energy agency. This agency would then use the materials for peaceful uses. The IAEA was inaugurated in Vienna, Austria in 1957. (Manhattan Project)

In conclusion, I explained the purpose of the Manhattan Project was to gather information on nuclear technologies and develop an atomic weapon that would be useful in the World War II. I mentioned the two different types of atomic bombs created, gun-type and implosion-type, and the droppings of Little Boy and Fat Boy on Hiroshima and Nagasaki. I explained the objective of Operation Alsos and that it's main purpose was to gather intelligence, materials, and scientists from Germany and to discover the German progress on their nuclear operations. I went through the three phases of the Alsos Mission, Italy, France, and Germany and their contributions towards the overall mission. I mentioned the sub-mission Operation Harborage and how it led to the capture of many famous German scientists, including Otto Hahn, Carl von Weizsacker, and Max von Laue. I then proceeded to discuss the consequences and influences of the Alsos Mission and the Manhattan Project and what it meant for society and for the scientific community.

Works Cited

- "Alsos Mission." *Wikipedia*. Wikimedia Foundation, 22 Apr. 2014. Web. 22 Apr. 2014.
- "History - The ALSOS Missions of the Manhattan Project." *History - The ALSOS Missions of the Manhattan Project*. N.p., n.d. Web. 22 Apr. 2014.
- "The Manhattan Project -- Its Story." *The Manhattan Project -- Its Story*. N.p., n.d. Web. 22 Apr. 2014.
- "The Manhattan Project." *The Manhattan Project*. N.p., n.d. Web. 22 Apr. 2014.
- "The Manhattan Project." *Ushistory.org*. Independence Hall Association, n.d. Web. 22 Apr. 2014.
- "Manhattan Project." *Wikipedia*. Wikimedia Foundation, 21 Apr. 2014. Web. 22 Apr. 2014.
- "The Scientists behind the Manhattan Project." - *Atomic Heritage Foundation Wiki*. N.p., n.d. Web. 21 Apr. 2014.