Bomb Study Guide

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BOOKRAGS

Contents

Plot Summary

The “Bomb” is the story of the discovery of the atomic bomb during the 1940s. The wold was at war during the first half of this decade. Germany was trying to become a world leader and had attacked the surrounding countries, including Britain. The Soviets were allied with Britain while the Japanese were allied with Germany. The United States offered support to Britain but remained out of the fighting until the Japanese attacked Pearl Harbor, leaving thousands of Americans dead.

Meanwhile, a young German scientist had discovered atomic fission. He was confused by the results of his experiment and sought the advice of a colleague. She shared the information which eventually reached American scientists. They all realized that there was the potential for a huge bomb, bigger than the world has ever seen. Albert Einstein contacted President Franklin D. Roosevelt, urging him to consider getting American scientists to work on atomic research. Roosevelt heeded Einstein's advice and the first American atomic project was launched.

An American military man named Leslie Groves was in charge of the project and he chose Robert Oppenheimer to lead the scientific teams. Oppenheimer was a top scientist of the time and he accepted the challenge. He helped recruit the best scientists from America and Great Britain and work began in earnest. Eventually, they worked out the details and became convinced they could make a bomb. From their experiments and considering the science, they knew it would be a huge explosion but no one was really prepared for the reality. When the successful test was concluded, they were first pleased with the results, then horrified by the fact that their invention would change the course of history.

While the Americans and British were working on the bomb, the Soviet Union was trying to create a bomb of their own. The scientists there were struggling and making limited success. It became evident that their best hope of creating an atomic bomb would be to steal the American research. They recruited scientists working on the project who were willing to share information. With the help of these scientists, they eventually had a full set of plans for an atomic bomb. It was too little to help with the war effort, but the Soviets eventually did use the plans to create a bomb of their own.

The United States government was stunned when the Soviets created a bomb. They ramped up their efforts to decode encrypted messages from known Soviets who lived in the United States during the research period. When they finally broke the code, they came up with information from a top-secret document. The document was traced back to a British scientist named Klaus Fuchs. He soon gave up every piece of information he had, including the names of others involved. One of those was Harry Gold.

Gold was an American who had a great deal of information about the Soviet spies of the day. Fuchs didn't face the death penalty because Britain and the Soviet Union were allies during World War II. Gold wasn't as fortunate. He cooperated with the FBI's investigation and was spared the death penalty. A third person accused of handing off

sensitive secrets was Ted Hall. The government was never able to make a case against him and he was never charged.

At the end of the war, the American government pushed for development of more bombs and of more powerful bombs. Oppenheimer objected, saying it wouldn't make America safer if every country built bigger bombs.

Skinny Superhero - Enormoz

Summary

The story opens with the Prologue, May 22, 1950. A man named Harry Gold was rushing around his bedroom in Philadelphia. He was still in his pajamas and was trying to destroy papers that hold evidence of his crimes. A few minutes later, Federal Bureau of Investigations agents Scott Miller and Richard Brennan arrived. The FBI had already questioned Gold and he knew they were coming. Gold was a chemist and he allowed the men into his room where they began to search. They found some items, including a map of Santa Fe, New Mexico, with a spot by the Castillo Street Bridge marked with an X. He later realized he could have explained away the map but at the moment he slumped down and offered to tell his full story.

Part 1: Three-Way Race, opens with a chapter titled Skinny Superhero. This “skinny” man was Robert Oppenheimer. He was a physicist at the top of his field, but as a person, he was forgetful and easily distracted. He was a professor at Berkeley University in California and his friends called him Oppie.

From an early age, Oppenheimer was very interested in learning. He didn't fit in with other boys of his age and he spent a lot of time with science as a way of making up for the lack of childhood friends. He earned a degree from Harvard followed by advanced degrees in Britain and Germany. He returned to America and began work in theoretical physics. When a student came to him with a problem, he would spend hours in explanation. When he sat in on lectures by other professors, he would verbally call them out if he felt the information was too basic. He was obviously brilliant but his students felt that he was “sort of nuts.” He was so wrapped up in his work as a physicist that he didn't know about a major stock market crash until 6 months after the event.

When Oppenheimer saw the effect economics had on his students, he began to pay more attention to world events. He saw Adolf Hitler building up for a war and Oppenheimer was angry. He wanted to do something but didn't know how he might contribute.

In The U Business, a German chemist named Otto Hahn set up an experiment in Germany in December of 1938. There was an emerging understanding about atoms and Hahn wanted to know what would happen if a neutron crashed into a uranium atom. He found that it caused the release of energy in the form of an explosion. He believed he must have made a mistake. He sent the results to a former colleague, Lise Meitner. Meitner was a Jewish physicist who had fled Germany because of Hitler. She told Hahn that they actually knew very little about the subject and said that he couldn't say his results were impossible. She discussed it with her nephew, a physicist named Otto Frisch, and they came up with an explanation. Hahn used a small amount of material and got a very small explosion. They considered what would happen with a large lump

of uranium, if all the atoms were split at the same moment. They knew it would be “the most powerful bomb ever built.”

News spread quickly among the science world. Frisch shared the discovery with Niels Bohr who was bound for America. He explored the idea during his voyage and spread the news at a conference which resulted in a newspaper article, further spreading the word. Luis Alvarez read the article and rushed to tell Oppenheimer who realized this could be the key to a weapon of mass destruction. He knew that if he had figured out the link between this discovery and the possibility of a bomb, others would figure it out as well, especially considering the world's situation at the time.

In Finding Einstein, two Hungarian Jews were in New York. They were Eugene Wigner and Leo Szilard. They feared that Germany was already working on an atomic bomb. They found Albert Einstein and convinced him to write a letter to President Franklin D. Roosevelt regarding the possibility. Alexander Sachs, a personal friend of Roosevelt's, delivered the letter and Roosevelt realized he would have to take action.

In Tradecraft, Harry Gold's family was struggling financially. Tom Black helped Gold find a job and Gold was grateful. Black called on Gold to help the Communist Party by stealing chemical processes from the Pennsylvania Sugar Company where he worked. Gold felt he owed Black and he agreed, thinking that it couldn't hurt anything. Gold soon realized that Communist rulers were ruthless and that it wasn't the idyllic life Black described. Then Gold's Soviet contact insisted that Gold look for a job in the weapons industry and that he recruit others. The demands came with threats.

Gold was soon under a new handler. The man's name was Semyon Semyonov, known to Gold as Sam. Gold delivered documents but knew they were of little value. The Soviets released him for a time, then demanded he begin acting as a courier for stolen documents.

In Rapid Rupture, Semyonov was in the United States working as an engineer but the FBI kept an eye on him and others suspected of being associated with Communism. Oppenheimer visited a friend named Haakon Chevalier who was an active Communist. Because of this visit, the FBI began watching Oppenheimer.

Meanwhile, Roosevelt had launched the Uranium Committee to look into the possibility of an atomic bomb. The project would eventually be code named the Manhatten Project. Progress was slow until Oppenheimer was invited to attend a meeting. Two months later, the Japanese attacked Pearl Harbor and America declared war. Americans were outraged by the vicious attack. Oppenheimer put his energy into finding a way to ensure America had an atomic bomb before Hitler could produce one in Germany. Oppenheimer contacted a physicist named Robert Serber and explained the situation. Serber and his wife moved from the University of Illinois to an apartment over Oppenheimer's garage. Together, Oppenheimer and Serber begin work in Oppenheimer's college lab. They were thrilled and terrified over their task.

In Norway Connection, a 29-year-old Norwegian named Knut Haukelid was among a group of his countrymen who refused to give up when Germany invaded his country. The men did everything they could to fight back but Haukelid was eventually forced to flee the country.

In Enormoz, a Soviet physicist named Georgi Flerov looked for news about atomic research. The fact that there were no newspaper reports about the program indicated to him that the Americans were keeping their research secret. Flerov feared Germany would be the first to create the bomb. Germany and the Soviet Union were enemies and Flerov was afraid that Germany would use the bomb against the Soviets. Soviet leaders instructed the KGB, the Soviet's secret police service, to steal information about the bomb. Semyonov was among the Soviet spies in America.

One day, a KGB courier named Zalmond Franklin had a chance encounter with a friend, Clarence Hiskey. Hiskey was a chemist and he told Franklin he was working on a bomb that could destroy an entire city. Hiskey was moved to another lab and the FBI was watching with a KGB spy contacted him there. Hiskey was then drafted into the army and shipped off to Canada where he was never again involved with any aspect of the bomb project. The Soviets continued to work toward stealing information. Their assignment was code named Enormoz, which is enormous in Russian. They had a list of people who might be working on the bomb who might also be sympathetic to the Communist Party, with Oppenheimer's name at the top of that list.

Analysis

There are several historic photos at the beginning of Section 1. They include a shot of Albert Einstein, Franklin D. Roosevelt, and Robert Oppenheimer. Others involved with the early days of a program to develop an atomic bomb are also pictured. These pictures give the reader an image to go along with the various characters. The story is true and the use of the photos lends a higher level of understanding that the events of the book were carried out by real people.

There was a great deal of political maneuvering going on while the various countries were trying to develop the atomic bomb. Russia, now known as the Soviet Union, was allied with Britain against Germany. The United States was giving aid to Britain in their fight against Germany. That made the Soviets allies with America, but the American government didn't entirely trust the Soviets. Japan became allied with Germany and was Japan's attack on Pearl Harbor that drew the Americans into World War II. When the United States had British scientists working on the bomb alongside American scientists, they didn't invite the Soviets to participate. Immediately after the war, America and the Soviets become embroiled in what became known as the Cold War. There wasn't active fighting but each wanted to take over as the world's superpower.

Hiskey was apparently the first person to announce to a member of the KGB that he was working on a huge bomb for the United States. The author doesn't reveal why Hiskey made the statement but he immediately regretted his comments and begged his

friend to forget it. This happened very early in the project and Hiskey probably didn't have a great deal of information yet to share, but Germany and the Soviets would have wanted it. The United States had already begun to keep all their work secret. Hiskey is an example of the fatal human flaw that was a problem with hiding the project. He might have simply wanted to tell someone what he was doing. All those working on the bomb project were sworn to secrecy and some people find it difficult to live with a secret, especially one of that magnitude.

There was a pervading attitude of distrust during this time in American history, especially against the Soviet Union. Americans kept thousands of people under near-constant surveillance in an effort to keep the secret documents away from the Soviets. This attitude became known as the Red Scare. In the decades after the war, the distrust continued, especially after it became known that the Soviets had gotten top-secret information.

Discussion Question 1

Describe the world situation during this period in history, including political alliances and the impact of those alliances.

Discussion Question 2

Why do you think the Soviet Union spent so much time trying to steal information from the United States?

Discussion Question 3

Why do you think the author includes photos of actual events?

Vocabulary

incriminating, sifting, commando, repulsively, devouring, theoretical, exercrable, calamity, manifestly, caustic, ransacked, concocted, ominous, premeditated, righteous, legitimate, consulate, invasion, hesitation, elements, allegiance

On the Cliff - High Concentration

Summary

Part 2: Chain Reactions opens with a chapter called On the Cliff. President Roosevelt met with Britain's Prime Minister Winston Churchill. The two agreed to pool their country's resources to build an atomic bomb. Because Britain was constantly under attack, the work would be done by scientists from both countries at labs in America. Colonel Leslie Groves was chosen to oversee the project. Groves chose Oppenheimer to be in charge of the scientists who would build the bomb. Opponents said Oppenheimer couldn't be trusted because of previous interest in the Communist Party. Oppenheimer said his interest was a thing of the past. Groves insisted he be cleared for the project.

Army doctors gave Oppenheimer a physical but he failed. He was almost six feet tall and weighed just 128 pounds. He was a chain smoker and had a chronic cough. Groves insisted that doctors pass Oppenheimer and they did. Groves knew Oppenheimer would never be fit to fight in the war but felt he was the key to building the atomic bomb, which might put America in a position to win the war.

In International Gangster School, Norwegian Knut Haukelid was recruited to work for the Allies – America, Britain, and the Soviet Union. He would be sent to sabotage specific sites in enemy territory. He was trained at Special Training School No. 3 in London, otherwise known as the International Gangster School. There, trainees were taught to pick locks, set booby traps, break into safes, kill without weapons, and parachute in the dark. Jens Poulsson was leader of Haukelid's team.

The Germans had control of a hydroelectric plant in Norway that made “heavy water,” an element the Germans were using in their work on the atomic bomb. Haukelid and Poulsson were to destroy the plant. Haukelid was injured during training and didn't get to go. Poulsson's team set out.

In Gliders Down, Poulsson's team was far from their intended target. Their support arrived in gliders but two gliders crashed. All the men were either killed in the crash or executed by the Germans.

In Quiet Fellow, Klaus Fuchs was a German-born physicist who was getting information to a Soviet spy. Fuchs was working on the atomic bomb project but the information to which he had access was really of limited worth to the Soviets. They stepped up their efforts. Oppenheimer's reputation as a scientist made him an appealing target. A Communist sympathizer told Oppenheimer his door was always open if Oppenheimer had information to share. Oppenheimer refused and the subject didn't come up again.

In Disappearing Scientists, Oppenheimer and Groves searched for a place to conduct their research. They found the Los Alamos Ranch School in a remote area of Northern

New Mexico. The government shut down the school and Oppenheimer got to work, recruiting all the best scientists from across the country. All over the United States, scientists dropped what they were doing and moved to New Mexico. Richard Feynman from Princeton was among them.

In Chicago Pile, a group of students at the University of Chicago set up an experiment under Enrico Fermi. Scientists involved in the bomb project had come up with the idea of a chain reaction, but no one yet knew if it would work. Eugene Wigner and Leo Szilard, who had first approached Einstein, were present to watch. When the experiment was over, Fermi had successfully controlled the release of atomic power.

In Operation Gunnerside, Great Britain and the United States still need to destroy the Vemork hydroelectric plant where the Germans are making the heavy water for their work on the bomb. The plant is on a cliff, making it unlikely that bombers could destroy it. Haukelid joined a team for an operation known as Gunnerside. They would join up with Poullson's team and bomb the plant from the ground. All of them have a “death pill” so they can commit suicide before being questioned. The two teams connect and decide the only option is to climb up the side of a cliff and plant a bomb.

In High Concentration, they make it to the top of the cliff, which is unguarded. There are only a few people present. They split into two teams with one standing guard outside and the other going in to plant the bomb, which goes off as planned. None of the men is caught.

Analysis

The photos at the opening of this part of the book include some of the major players in America's efforts to build the bomb and in the Soviet Union's efforts to steal it. There is also a photo of the Vemork Hydroelectric plant, which became an important site in the German's efforts to build a bomb.

The bomb project was vital for America, Britain, and the Soviet Union. To modern-day readers, it seems that Colonel Groves should have been happy to be chosen to head up that project. He was an engineer and had been in charge of building the Pentagon. He wasn't supposed to do any of the science related to the bomb, but would be in charge of putting the project together and ensuring that everyone working on it had everything they needed. It would be a huge task and Groves was qualified. However, he was disappointed that he was going to be relegated to a job in America rather than being directly involved in the fighting.

The reader is beginning to get more information about Oppenheimer by this point in the book. It was established early on that he was sometimes absent minded. He once left his date alone in a car while he wandered around, thinking about physics, then just walked home and went to bed. He was tall and very thin. He was a chain smoker. He was brilliant in his field and usually patient about explaining ideas and theories to others, but was inpatient when he felt the topic was not deep enough for those

discussing it. Someone said that he knew a lot about everything, with the exception of sports.

An important part of Oppenheimer's character is seen in his work on the bomb project and then his reaction after the bomb was used against Japan. He was caught up in the work and truly felt that America had to be the first to complete a bomb in order to keep Germany and Japan in check. Then he saw the devastation the bomb would cause and he felt a deep sense of responsibility for having been a driving force behind the bomb's creation. All this is revealed as the story moves forward but it's important for the reader to be aware of this aspect of Oppenheimer's character as the author talks about his work on the bomb project.

Oppenheimer is an example of America's fanatical view of Communism that existed during this time in American history. There were lists of people who reportedly belonged to the Communist Party or who were sympathetic to the Communists, and the FBI constantly watched many of these people. In some cases, they were arrested and forced to give up more names. The result was that there were a lot of names on the lists who were really not Communists at all. Anyone who ever showed any interest in Communism wound up on the list. Oppenheimer had been interested in the ideas behind Communism as a young man but, like many people, the interest passed. As far as anyone knows, he remained loyal to the United States and never shared any of the secrets associated with the bomb. However, he was constantly watched and when he disagreed with America's stand on building an even bigger bomb, his previous interest in Communism was again investigated.

Those present for the experiment in Chicago Pile were experienced and smart in the field of science. Generally, those present would have cheered for a successful experiment but that wasn't the case here. They were completely silent, even as they drank a toast to their success. Even at this early stage in the work, the scientists realize the enormity of what they're doing and what it can mean for the human race. This understanding of the effect is one of the themes seen throughout the book.

Discussion Question 1

Describe Colonel Groves' reaction to the news that he would head up the bomb project. Why do you think he was disappointed?

Discussion Question 2

Describe what you know about Oppenheimer at this point. Keep the list and add to it as information is revealed.

Discussion Question 3

Why do you think Americans are so suspicious of anyone remotely associated with Communism or the Soviet Union?

Vocabulary

endeavor, probabilities, infuriated, logistics, essential, chronic, incapacitated, bulked, colossus, precipices, fiery, retaliate, saboteurs

The Gatekeeper - Two Inside

Summary

In The Gatekeeper, a single mother named Dorothy McKibben lived in Santa Fe, New Mexico. A local businessman offered her a job as a secretary but offered few details about the job. She agreed to an interview. A man who didn't identify himself interviewed her and she was so enamored with his personality that she accepted the job. Her job was to be the “gatekeeper” who helped arriving scientists find their way to the Low Alamos headquarters. She had a series of instructions, including that they were never to refer to each other as “doctor” to avoid drawing attention to themselves. Sometimes people would stop in and ask McKibben but she always feigned ignorance.

Despite the safeguards, the people of the area knew there was something going on at the Los Alamos site. There were lots of military trucks and lots of new people in town, including a number of men with European accents. These were scientists recruited by Oppenheimer. The rumors began to fly, including that the military was making submarines or death rays, or that the base was serving as a nudist colony or a home for pregnant military personnel. Groves decided to try to counter the rumors. He sent physicist Robert Server and his wife, Charlotte, to Santa Fe. They were to spend an evening spreading the rumor that the military was building an electric rocket. No one paid attention to that rumor and others continued to fly.

In The Gadget, Serber led the first meeting of the scientists. Most were amazed that they were going to help build a bomb. Oppenheimer warned him to stop using the word bomb because there were so many workers involved in construction, some within earshot. Serber began calling it “the gadget” and the nickname stuck. While work began, the buildings and campus were still under construction.

In Laboratory Number 2, the work on the bomb continued to be a secret. The Army counter-Intelligence agency was given the responsibility to guard the secret, specifically from Germany and the Soviet Union. They watched Oppenheimer. One day he traveled to San Francisco where he met Jean Tatlock. She had been Oppenheimer's girlfriend and was a Communist. Army intelligence urged Groves to fire Oppenheimer, but Groves refused. He said Oppenheimer was vital to America's goal of being first to build the bomb. A military colonel named Kenneth Nichols told Oppenheimer that he was being watched and warned him against seeing Communist friends. Oppenheimer told Nichols that Haakon Chevalier had approached him, but said the conversation ended there. Nichols didn't believe him but Groves continued to defend him.

Physicist Igor Kurchatov was in charge of the Soviet's bomb project but he was having problems. Many things were scarce because of the war. He didn't have the impressive team of scientists Oppenheimer had. It was more vital than ever that the Soviets steal the work related to the bomb project in the U.S. The KGB recruited Gold.

In Ferry Job, Groves learned that the Germans were rebuilding the Vemork plant and would soon be producing heavy water again. The Germans knew the plant wasn't a safe place to keep the water, and they planned to move it to Germany. Groves ordered the military to stop the shipment. Knut Haukelid was chosen for the mission.

Haukelid and another underground fighter, Rolf Sorlie, began to look for a way to eliminate the shipment of heavy water. An engineer at the plant, Kjell Nielsen, provided information. He said the Germans were prepared for an attack and were carefully guarding the water. The water was being put in barrels for transfer. The barrels were going to be moved by railroad to Lake Tinn, and would be moved up the waterway by a ferryboat called the Hydro. Planes would be flying alongside the railroad to prevent an air attack. Haukelid and Sorlie decided they'd have to sink the ferry at the deepest part of the waterway.

They enlisted Knut Lier-Hansen to help and came up with a plan. They boarded the ferry to plant a bomb. A security guard saw them but Lier-Hansen knew the man and improvised a story about needing to hide something from the Germans. The security guard assumed they were hiding supplies and didn't stop them. They used clocks to time the detonation and the bomb went off exactly as planned. The entire ferry sank within four minutes, including the barrels.

In Dirty Work, the three men learned that their plan was a success. They went their separate ways. Haukelid returned to Norway, skiing across the border, and continued to fight with the resistance until the end of the war. Groves was glad the heavy water shipment had been destroyed but he still worried about the German progress on the atomic bomb. He compiled a list of the top scientists in Germany, looking for those likely to be working on the project. Werner Heisenberg's name came to the top of the list and Groves agreed to a plan to kidnap Heisenberg.

Military officials began to work on the plan and Colonel Carl Eifler was picked to carry out the kidnapping. Eifler agreed that he could kidnap Heisenberg and get him into Switzerland for transport out of the region. He knew many things could go wrong and he asked what would happen if he was caught. His orders were to “deny Germany the use of that brain,” referring to Heisenberg. His commander also said that they would deny even knowing Eifler if he did get caught.

In Secret Cities, Oppenheimer was under a great deal of stress and he lost weight due to the situation. He spent his time going from one section of the lab to another. He always knew what was going on in every section and helped scientists solve various problems.

Richard Feynman was one of the scientists. He was something of a trouble maker. He would sometimes pick locks on filing cabinets to get files he needed, then return the files to their owners, almost proud of the fact that he broke in. Oppenheimer called on Feynman to go to Oak Ridge, Tennessee, where the government was opening a plant to prepare the uranium for the bomb. Feynman was supposed to help the workers there handle the process safely without revealing the fact that they were creating a piece that

would be used in an atomic bomb. When he arrived, Feynman found serious safety issues. He argued for, and was finally granted, permission to tell select officials about the overall project. With this plan, he was able to get the plant running safely.

The plant began to function and to produce the specific uranium needed for the bomb. At full capacity, the plant would produce enough of the material to make a single bomb by the summer of 1945. A senator from Missouri, Harry Truman, began to ask questions about the money being funneled into some of the war plants. Secretary of War Henry Stimson assured Truman that the project was necessary but refused to give him any details.

In Man with Four Gloves, Harry Gold met with Klaus Fuchs in New York. His instructions were to carry a tennis ball so that his contact would know him on sight. Fuchs was wearing one pair of gloves and was carrying an extra pair. They agreed to meet again but set some ground rules in order to avoid drawing attention to themselves. They would never meet twice in the same place and would never wait more than five minutes for the other to arrive. At their second meeting, Fuchs told Gold about the basic science behind extracting the specific kind of uranium for the bomb. Gold put the information on paper and forwarded it to a Soviet Union agent.

Fuchs worked with a team of British physicists on specific areas of research and gave all his information to the Soviets. No one paid him any attention. Fuchs and Gold continued to meet and the KGB was thrilled to have a direct source of information. Fuchs missed the next meetings and Gold learned that he was no longer in New York. The Soviets were upset.

In Born Rebel, Theodore Hall was a genius who graduated high school at age 13. A professor offered Hall a spot on a special military project. Hall told his roommate, Saville Sax, who said Hall should take the assignment and share the information with the Communists. Hall made it clear he wasn't interested in Communism, but he did take the assignment. He began work on the project under an Italian named Bruno Rossi.

By the summer of 1944, the government was also producing plutonium. A small sample of plutonium arrived at Los Alamos, meaning the scientists could begin some further experiments. They soon realized that plutonium and uranium needed different processes to create chain reactions. Hall, at 18, was the youngest scientist in the project. He felt sympathy for the Soviets, who were under direct attack from Germany. He hoped that the end of the war would bring a period of world peace but worried about the outcome if America was the only country to possess the technology to produce a bomb.

In Two Inside, Ted Hall went home for a visit. He contacted Seville Sax and asked how he might get information to the Soviets. Hall eventually made contact with a Soviet official named Sergei Kurnakov, who was initially skeptical that this youngster could really have top-secret information. Once he was convinced, he asked why Hall would share the information. Hall said the Soviets were the only ones who could be trusted with “such a terrible thing.” The Soviets were excited with this new source of information

and then they learned that Klaus Fuchs was also at Los Alamos, working directly on the project.

Analysis

The photos at the opening of this section include a shot of the Los Alamos Project Main Gate. There is a small building with a car parked beside it. A sign indicates that “passes must be presented to the guards.” There is nothing to really indicate that top-secret work was going on inside but the remote location meant that people wondered about the sudden level of activity. The choice of a place for the work seemed to be a wise decision because it was remote but it also meant that a sudden influx of people caused speculation.

Dorothy McKribben is an interesting character though she is introduced only briefly in the book. She became known as the “gatekeeper” because she was the first person associated with the Los Alamos project once the scientists reached Santa Fe, the nearest large town where the scientists arrived for further orders. McKribben gave them their new address – a post office box in Santa Fe – meaning that no one would give out their physical address to family and friends. There were a lot of security measures put in place as the government tried to keep the project a secret. In the end, the Soviet Union got the plans for the atomic bomb anyway.

Another example of the military trying to guard the secret is seen in the chapter titled Laboratory Number 2. Oppenheimer visited a girlfriend in San Francisco and he spent the night at her apartment. The military was watching and they knew that she was a member of the Communist Party. The fact that Oppenheimer was visiting this woman made the military pay closer attention. They felt he should be eliminated from the program because of this association. This “guilt by association” attitude was seen repeatedly during this time in American history. What's interesting is that the Communists knew how the military and the FBI tracked people. They warned operatives to never attend a meeting of the Communist Party and to never associate with known Communists. If they had really recruited Oppenheimer, they would have told him to stay away from this woman.

Haukelid and his associates depend on information from inside the heavy water facility to plan their attack on the shipment headed for Germany. This is evidence that there were people outside the United States and Britain who were willing to give sensitive information. This is exactly what the governments of all the countries were worried about, and all of them worked to try to find anyone who might share the information. Other countries weren't any more successful at this task than the United States.

The military tried to keep information about the bomb project limited to just the people who absolutely needed to know. When the first group of scientists gathered for a meeting, Oppenheimer realized that the word “bomb” was being used a lot. There were workmen in the building and everyone was aware that the project needed to be kept secret. That was true when Richard Feynman went to the uranium plant in Tennessee.

There, the military officials wanted him to keep all the details of the project secret but he knew that the people in charge wouldn't follow exact protocols without knowing why. He gave more information than the military wanted, but the result was that the people in charge of that plant realized they were handling a dangerous substance and they had to be very careful. This is all part of the overall theme of secrecy seen throughout the book.

There were a lot of brilliant people at Los Alamos. While the work was serious, the reader has to remember that these were people with other interests besides their work on the bomb. They needed diversions and many of them probably wanted to find something fun to do outside the lab. They all had personalities as well and there were bound to be clashes. Feynman was something of a rebel and was often in trouble. Many of the documents related to the project were locked away. Feynman would go into a lab, pick the lock on a file cabinet, and take a file that he needed, then he would return it to the owner, making it obvious that he had broken into the file cabinet. This is just one example of the human element behind building the bomb. Many of these people were bound to feel a sense of responsibility for creating the bomb, which is an element of one of the book's themes.

There's an interesting aspect to the chapter titled Secret Cities. Harry Truman was a senator from Missouri and he began asking questions about the money being poured into some areas of the war plants. He was basically told that the information was being given on a “need to know” basis, and that Truman was not in a position to need to know. Truman would become vice-president before the project was completed, and would become president before the bomb was used. Truman was the man who ordered the military to use the bomb.

The author includes a great deal of information about the “tradecraft” of spying. There were protocols in place, such as signals and secret exchanges of words that would ensure a person was the correct contact. This is seen in the chapter titled Man with Four Gloves, and it's a theme seen throughout the book.

Discussion Question 1

What precautions were taken by the military in an effort to keep information about the bomb secret? Why did the United States take these precautions?

Discussion Question 2

What was life like for those working on the bomb project in Los Alamos?

Discussion Question 3

Why did Ted Hall decide to give information to the Soviet Union? Do you think he was right?

Vocabulary

intrigued, haggard, espionage, frustrated, intolerable, exert, reckless, unique, conceded, punctured, vial, assembly, agonizing, massive, compartment

The Pilot - Hiroshima

Summary

In The Pilot, a fighter pilot named Colonel Paul Tibbets was sent to Colorado where he was questioned about his background and introduced to the idea of the atomic bomb. Oppenheimer's scientists had not yet finished the bomb but the military wanted to be prepared. Tibbets was put in charge of the 509th Composite Group.

In Swiss Deal, Carl Eifler, the man charged with kidnapping Heisenberg, was ordered to step down from the mission. The military was still planning to grab Heisenberg, but had chosen another operative for the job. His name was Moe Berg and his mission was code named Alsos. Berg was supposed to travel with the Allied forces in Europe, looking for any information that the Germans were close to creating a bomb of their own. He learned that Heisenberg was speaking at a conference in Switzerland. Berg went to the lecture with plans to kill Heisenberg if he became convinced that the Germans were close. Berg wasn't sure at the end of the lecture and let Heisenberg go.

In Implosion, Sax and Hall met in New Mexico and Hall gave Sax new information. Work on the bomb continued and scientists became convinced that they could detonate a bomb of plutonium by creating an implosion. Soviet scientists were excited to get the information about implosion.

Falling Stars opens in April of 1945. By this time, Harry Truman was vice-president to President Roosevelt. Truman was summoned to the White House where Eleanor Roosevelt met Truman with news that the President had died. Truman was sworn in as President and Secretary of War Stimson told him about the atomic bomb project. Meanwhile, the Germans were some two years behind in their effort to create a bomb of their own and Germany was at the brink of surrender. The Alsos team took Otto Hahn, the man who first discovered fission, into custody. A few days later, they captured Heisenberg, and scooped up all the scientists they could find. The Soviets rushed into Germany but discovered that the scientists were gone and that their information was basically worthless.

In Land of Enchantment, Germany surrendered and Hitler committed suicide. Oppenheimer's team thought the project would be halted but Stimson told them to continue, pointing out that the United States was still at war with Japan. The scientists were nearing completion of a bomb and decided they should do a test of the plutonium bomb. They had enough uranium to make only one, so a test of that bomb would not be possible. Fuchs gave the complete plans for the plutonium bomb to the Soviets.

In Trinity, scientists set up a test for early July. Meanwhile, all the German scientists were taken to an estate named Farm Hall where they were told they could do anything they wanted, except leave. They were in Southeast England but weren't told anything

about their location. The Americans and British officials bugged the main areas of the estate in order to learn what the German scientists knew about atomic science.

On July 5, Oppenheimer alerted the other scientists involved in the Manhattan Project that the test would be scheduled for sometime after the middle of the month. On July 11, scientists began moving the parts to the desert where the test would take place, then working on the assembly of the plutonium bomb. The scientists also began moving the uranium to an American air base at Tinian, an island in the Pacific. Even if the plutonium bomb failed, the uranium bomb would be ready to deploy by August.

In Test Shot, William Laurence was a reporter for the New York Times. Other than scientists and military officials, he was the only person allowed at the test. He was confused when he was placed 20 miles away. Ted Hall was with soldiers at the edge of the site. Scientists finished the assembly and left the immediate site for the bunkers a safe distance away. The test was set for night and Laurence was amazed to see officials covering themselves with sunscreen.

Oppenheimer was worried that something would go wrong. Then the bomb detonated and lit up the area like bright sunlight. Everyone was amazed by the light and heat. About 30 seconds later, they heard the blast then watched the mushroom cloud rise into the air. The scientists were relieved that their bomb worked, then silent as they realized the magnitude of the blast and that they had created it.

In Little Boy, people in Amarillo, Texas, 450 miles away, saw the flash. People up to 150 miles away heard the sound and people 200 miles away felt the repercussions. The military distributed the story that the explosive dump at the Alamorgordo Air Base exploded, and that no one was injured. Truman received a coded message that the test was a success. Truman was meeting with Soviet premiere Joseph Stalin. He “casually mentioned” that the United States had a new weapon. Truman was disappointed when Stalin seemed indifferent. He didn't realize that Stalin already knew all about the bomb.

Truman next had to decide whether to use the bomb against Japan. Japan was, for all intents, beaten, but refused to surrender under the terms offered. Officials told Truman that using the bomb would save many American lives by bringing an immediate end to the war. Truman decided to issue an ultimatum. Japan refused to surrender. Truman issued the order to Tibbets to drop the bomb as soon as possible after August 3, 1945.

Scientists arrived at Tinian to assemble the bomb. They nicknamed it Little Boy. It was ready to deploy on August 2. Military personnel loaded Little Boy on Tibbets plane, named the Enola Gray for his mother. Tibbets then revealed their mission to his crew. Takeoff was scary because of the extra weight but Tibbets got the plane in the air. He then read their coded instructions. They were to drop the bomb on Hiroshima.

In Hiroshima, Tibbets and his crew identified Hiroshima. At 8:15 that morning, they dropped the bomb. Tibbets then rushed to get the bomb out of the blast area. After the detonation, the plane circled back to verify the hit. They were horrified at the

destruction. They hoped this would bring about the end of the war but they were aware that this would change how wars were fought.

Analysis

The idea of gathering all the German scientists was initially meant to get them all out of the country so that they couldn't continue to work on a bomb for the Germans. Germany surrendered but the military still took all the scientists into custody and kept them from communicating with anyone. Considering that Germany was so far behind in their work on the bomb, it seems somewhat unnecessary, but the Americans had another purpose. They wanted to be sure that the scientists couldn't talk about the atomic bomb in public. The Americans were expecting that they would need to drop the bomb on Japan and they wanted to be sure the Japanese wouldn't be expecting it. This is a piece of emotional warfare because it ensured that the Japanese couldn't be ready for the devastation that would happen if they did have to drop the bomb.

Oppenheimer and the other scientists were naturally worried that their test would fail. They had done all the appropriate testing up to that point, but there were still many unpredictable aspects of the project that meant it was possible that the bomb wouldn't detonate as planned. They were initially relieved that it did detonate as planned, then were aware of the full destruction of the bomb. As that awareness crept in, the reaction changed. They weren't as horrified as some civilians and military personnel would be, because they had been involved in the building process and knew the potential. They were, however, aware that they had created this destructive force. This is one example of the reaction that's an important theme of the book.

Truman was with Stalin when he heard that the bomb had been successfully tested. When he told Stalin that the United States had a new weapon, Stalin was almost indifferent. Truman didn't even suspect that it was because Stalin already knew all about the American bomb project and even had plans for the bomb in his possession. The Americans had worked hard to keep the information secret and Truman probably couldn't bring himself to even suspect that the Soviets already had the information. This effort and failure to keep secrets is one of the book's themes.

The author includes a great deal of description of Hiroshima at the time of the blast. He includes eye-witness accounts of people who survived the blast and the accounts of the crew of the Enola Gray. The modern-day reader has to remember that no one had seen this kind of destruction from man-made weapons until this event. The crew of the Enola Gray were fully aware of this. They expressed their horror over the destruction. While it meant that America and their allies would likely win the war, they knew that other countries would eventually create their own bomb. The result would be that war would become even more brutal. Their reaction was typical of everyone who witnessed the destruction, and it's one of the important themes of the book.

Discussion Question 1

Why did the United States come up with the idea of kidnapping top German scientists?

Discussion Question 2

What was the reaction of the crew of the Enola Gray after they dropped the bomb on Hiroshima? Compare their reaction to that of the scientists after the successful testing of the first bomb.

Discussion Question 3

Why did Truman decide to use the atomic bomb against Japan?

Vocabulary

intensified, vital, interrogation, entrusted, comprehension, mediocre, tucked, symmetrical, corroborate, disinformation, exception, policies, careworn, immense, jeopardizing, interval, lamented, personification, justification, ferocious, scheme, feverishly, enchantment, components, convoy, crevasse, jubilant

Reaction Begins - Epilogue

Summary

In Reaction Begins, Truman was aboard a ship returning to America when he got word of the successful bombing of Hiroshima. He announced it to the crew and the men erupted into cheers. The scientists at Los Alamos learned that the bomb was a success. Oppenheimer was relieved that the bomb “wasn't a dud” but then was sobered by the thought of how many people must have died in the blast. That reaction was typical with most of the scientists feeling that a celebration of their success would be “ghoulish.”

At Farm Hall, a British officer told Otto Hahn about the bomb. Hahn told the other scientists. They didn't know the rooms were bugged and talked about the implications. Heisenberg insisted that it wasn't a real atomic bomb. The scientists continued to talk about their own work and what they could have done differently. One of them says that even if they had created the bomb and used it on London, they would have lost the war. Another says he is glad they didn't create the bomb.

In the Soviet Union, Stalin didn't react to Truman's news until he was out of the public eye. Then he threw a fit and demanded that his scientists create a bomb. He promised to give them anything they need and threatened them if they didn't produce.

In Japan, officials called on their top scientist, Yoshio Nishina, who had been in charge of the bomb project for that country. Officials asked if he could produce the bomb in six months, saying they felt they could hold off surrender for that long. Nishina said it couldn't be done. Japan was shaken by the attack. Some 70,000 buildings were destroyed, leaving only about 6,000 standing. About 170,000 people died, either immediately or of the effects of the bomb. The Soviet Union, now safe from Germany, declared war on Japan. Japan's political leaders urged surrender but military officials refused. Stimson said the United States should do everything possible to make Japan surrender. Truman saw no options other than dropping another bomb.

At the air base in Tinian, officials were assembling the next bomb immediately after dropping the first. This bomb was nicknamed Fat Man because it was large and round. It was plutonium like the one tested at Trinity. Tibbets coordinated the mission but the pilot for this second bomb was Charles Sweeney. There was cloud cover that forced the crew to pass up the first target, Kokura. They arrived at Nagasaki, confirmed the target, and dropped the bomb. More than 40,000 people died immediately and thousands died later. Japan's leaders gathered and the emperor demanded that they surrender. The war officially ended on August 15.

In End Game, a Soviet spy named Lona Cohen arrived in New Mexico. She was supposed to meet Ted Hall but he didn't show up at the appointed place and time. She returned at other predetermined times but Hall never showed up. Hall was actually tied up with work at Los Alamos and couldn't get away. When he finally did, he met Lona,

who he knew as Helen. Cohen reminded Hall that he was taking a huge risk and told him he'd be welcome in the Soviet Union if “things got too hot.” Hall said he hoped it wouldn't come to that.

The British scientists began packing up to go home but wanted to have a party before they left. Klaus Fuchs volunteered to go get the liquor. He wrote down the vital details for building a plutonium bomb and then met Harry Gold. Fuchs gave Gold his report and they parted. She returned to the boarding house where she'd been staying. She removed all the tissues from a box and placed Fuchs' report inside, placing the tissues back in the box on top of the report. She then headed for the train station.

The government felt the danger of leaking information about the bomb had increased because of the successful test. They increased security and train passengers were being searched. They searched her bag but didn't search her tissue box, and Cohen made it onto the train. Both Harry Gold and Lona Cohen turned their reports over to the Soviets. The fact that the two had come from separate sources and that both held the same information convinced the Soviets that the data was correct. That fall, scientists began making an exact replica of the American bomb.

In Father of the Bomb, Oppenheimer left Los Alamos. Some said he was a “nervous wreck.” Everyone knew him as “Father of the Bomb” and part of him liked the fame. The other part hated that he'd created this weapon of mass destruction. He went to Washington, D.C., where he met with government officials. He felt that scientists could make more bombs and more powerful weapons, but that it would create a world in which no one was safe, including the United States. He wanted America to stop building bombs and to convince the Soviets to stop working on their own.

The American government disagreed. Officials, including Leslie Groves, wanted Oppenheimer to lead the team in building more bombs. Oppenheimer and the other scientists felt they'd done their duty and they wanted no part in building more. Oppenheimer resigned and returned to Washington, eventually meeting with President Truman. He told Truman he felt he had blood on his hands and begged Truman to stop building bombs. Truman assured Oppenheimer that they would “work something out” and that Oppenheimer would be part of that. Once Oppenheimer was out of the room, Truman was furious and said that he would never grant Oppenheimer another audience. Oppenheimer left and knew that he would have no control over the bomb.

In Fallout, the war ended and three years passed. Harry Gold fell in love with a chemist named Mary Lanning. He knew he could never have a “normal life” and held back, never allowing himself to tell her about his role in giving the bomb plans to the Soviet Union. He asked her to marry him but she couldn't quite bring herself to agree. Gold considered telling her everything but never did.

Eventually, the Soviets also created a bomb of their own. Their successful test was done in a plain region called Kazakhstan, 2,000 miles east of Moscow. Within days, a United States Air Force weather plane picked up radiation readings and it soon became evident that the Soviets had detonated an atomic bomb. Oppenheimer wasn't surprised.

Truman was. American intelligence officials began to wonder if information had been leaked from the U.S. Project. They had copies of telegrams sent from known Soviets during the war, but the information was coded. In 1949, four years after the war ended, Americans broke the Soviet code and realized that the Soviets had possession of a “top-secret” document in 1944. The document was produced by Klaus Fuchs.

Fuchs was back in Britain. By the time Americans knew he'd shared atomic bomb secretes, he was head of the theoretical physics division at the country's top atomic research division at Harwell. Fuchs was questioned but initially refused to admit wrongdoing. After awhile, he caved to the pressure and said he'd given the Soviets information, including the “full design of the atom bomb.”

Gold was working in a hospital lab when he read a newspaper story about Fuchs' arrest. He wasn't surprised when FBI agents showed up at his work. They asked to search Gold's house and he gave in. In the moments before the agents arrived, he rushed around, trying to destroy years of evidence.

In the Epilogue: Scorpions in a Bottle, Fuchs told officials everything and was moved to London for trial. He expected to be executed for treason. Because Britain and the Soviet Union were allies during World War II, Britain didn't see his crime as treason. He was sentenced to 14 years in prison. He was released early, in 1958, for good behavior. He moved to Communist East Germany, married, and worked on atomic research there. He died at 76 in 1988.

Gold began to talk freely to the FBI. He identified people he'd worked with in passing information to the Soviets. One couple, Julius and Ethel Rosenberg, were sentenced to death. The United States classified their crime as treason, even though the United States and the Soviet Union were allies at the time. The situation started a panic that became known as the Red Scare. Hundreds of people were identified as possible Soviet spies and remained under surveillance for years.

Gold cooperated and gave officials information. In exchange, he was spared the death penalty. He was sentenced to 30 years in prison and earned parole in 1952. He died at age 61 in 1972.

Ted Hall returned to school after the war, working on a doctorate degree in physics. He fell in love and told the young woman everything. They were married by the time the FBI questioned Hall. He didn't admit to anything and remained calm throughout the questioning, but refused to cooperate for a second round of interrogation. He refused to talk and the FBI had no hard evidence with which to convict him. In 1995, the coded messages became public. Hall's name rose to the top and reporters questioned him. His only comment was that he would not do things the same if he had the opportunity to re-live that period of his live.

Oppenheimer became the director of the Institute for Advanced Study in Princeton, New Jersey, and was a scientific adviser on atomic energy policy for the United States government. The Soviet bomb test created an intense situation between America and

the Soviets, and some U.S. officials wanted to continue research to make a stronger bomb. The theory of the hydrogen bomb was being debated by that time. Oppenheimer and some other scientists said that creating a bigger bomb wouldn't make American any safer. Some officials believed Oppenheimer didn't have the best interests of the United States at heart. Then the government revoked Oppenheimer's security clearance and eliminated his involvement with the government-based weapons research. He continued to teach until 1966. He died a year later of throat cancer.

The United States tested a hydrogen bomb on a Pacific island called Bikini Atoll in 1954. The island remains uninhabitable even in modern times. Several countries around the world, including the United States and the Soviet Union, built thousands of nuclear bombs. The author writes that the world has since “stepped back a bit from this cliff.”

The final section of the book is named Race to Trinity. This section includes a letter from Albert Einstein regarding his recommendations in the early stage of atomic research, including his recommendation that the United States quickly launch a research program of its own. The section ends with several photos of the first atomic bomb, including the detonation.

Analysis

The German scientists had an interesting reaction to the news that America had dropped the atomic bomb on Hiroshima. By the time they talked about it for a short time, they convinced themselves that they could have built the bomb themselves, if they had wanted to. They even decided that they could have finished their work ahead of the Americans, if they had set their minds to it. This is really interesting considering that the German scientists Otto Hahn first discovered the reaction that led to the atomic bomb while he was working in Germany. Germany had the basic principle before any other country, but still didn't manage to build the bomb before the Americans and British.

As is typically the case, politics played a role in the war and in the decision-making process. Truman wanted to bring an end to the war but didn't know how to do that without dropping another bomb on Japan. Stimson suggested that they offer Japan an option, including keeping their emperor in place. Truman refused. He said the American people were demanding that Japan surrender unconditionally because of the Japanese attack on Pearl Harbor. Truman considered his political career in making this decision. The reality is that this is typical but it's left to the reader to determine if it's ethical.

America threatened to drop the second bomb immediately after dropping the first. The Americans had one more bomb and Truman gave the order to drop the second bomb just days after the first. The plan was to make Japan believe America had lots of bombs available and that they'd keep dropping them until Japan was totally destroyed. The Japanese believed it and surrendered but the bottom line was that America didn't have another bomb available yet. It would have taken some time for another bomb to be prepared for detonation, but the Japanese didn't know that.

The author includes many small details about people and events that really brings the story to life. The reader has to question which of these are accurate because they are presented from the viewpoint of the people involved. For example, Lona Cohen boarded a train with plans for the plutonium bomb in a tissue box. She pretended to fumble with her bag when security officers asked for her ticket, and she handed the tissue box to the officer. They looked at her bag and then allowed her to board. She headed for the train, leaving her tissue box in the officer's hand. He called out to her and gave her back the box. That's Cohen's account of the exchange and it may or may not have happened exactly that way.

Discussion Question 1

Why did Truman tell the Japanese that the United States was prepared to continue dropping bombs on Japan until Japan surrendered?

Discussion Question 2

Why did Oppenheimer eventually lose his security clearance?

Discussion Question 3

How did Lona Cohen sneak the plutonium bomb plans out of the country? Does this prove that the Americans should have been more diligent in their efforts to keep the information secret?

Vocabulary

extend, concurred, obliterate, elation, ghoulish, contemplated, potentialities, staggered, dictator, perished, starvation, catastrophe, panicked, flinching, wrought, obtained, prowess, primarily, perplexity, tempered, implication, arsenals, persuasion

Characters

Robert Oppenheimer

Robert Oppenheimer became known as the “father of the atomic bomb.” Known to his friends as Oppie, he was a professor and one of the United States' top physicists during the early years of World War II, when the atomic bomb was still just a concept. He was selected by a military commander named Leslie Groves to head up the Manhattan Project, which was the code name for the government's efforts to build the bomb. At a casual glance, he seemed somewhat scattered but always knew what was going on in each department of the lab.

Oppenheimer was worried when the first atomic bomb was tested, fearing that any one of many things might have gone wrong. He tried to delay the test by a few days, giving his team more time to go back over calculations, and was relieved when the bomb detonated as planned. He was almost immediately aware that he had helped create a power that was too big to control, and he was right as several countries entered into a race to see who could build the most bombs.

Oppenheimer went to President Truman after the war, pleading for Truman to call a halt to bomb production. He told Truman that he felt he had blood on his hands for his role in building the bombs that were dropped on Japan. Truman dismissed him and later berated Oppenheimer for his weakness. Oppenheimer served as a government adviser for many years after the war and he always took the stand that the United States should not build more bombs, let along more powerful bombs. He was eventually dismissed from his role because of his conservative stances, though his opponents cited an affiliation with the Communist Party as the reason for the decision. Oppenheimer returned to teaching at a university and died of throat cancer.

Harry Truman

Truman was one of two United States Presidents involved in this era of the bomb project.

Truman was still just a senator when he first questioned the money being funneled into specific weapons programs. A military official told him the program was necessary but gave him no specific information. Years later, Truman was sworn into office and learned the details of the bomb program. He continued the government support and was in the Soviet Union when the United States conducted the first successful test of an atomic bomb. Truman casually announced to Soviet Premiere Stalin that the United States had a new weapon, but was disappointed when Stalin seemed indifferent. Truman had no idea that Stalin already knew about the bomb and had spies feeding information to Soviet scientists. Truman called for the military to drop the bomb on Japan, then

ordered the second bombing. Though the United States didn't have another bomb ready at that point, Truman gave the impression that there was an unlimited supply.

After the war, Oppenheimer told Truman that he felt he had blood on his hands. Truman had every reason to feel the same but he never publicly expressed that feeling. He was disgusted that Oppenheimer did. Truman refused to listen when Oppenheimer warned that building more powerful bombs would prompt a world-wide arms race.

Harry Gold

Harry Gold was a chemist who struggled through some difficult times. During that period of his life, a Communist helped him find a job and Gold felt a level of loyalty to the man. When the man asked Gold to help the Communist effort, Gold agreed. When he tried to extract himself, he was blackmailed into continuing. He later served as a courier and carried an important report from Klaus Fuchs.

Ted Hall

Ted Hall was a young college graduate when the United States was working on building the atomic bomb. He was apparently a genius, having graduated high school at 13. He was recruited for the bomb project and realized pretty quickly what he was working on. He wasn't really a Communist sympathizer though he felt sympathy for the Soviet Union because they were under attack from Germany. He gave secrets to the Soviets but his greater motivation was a fear of what would happen if the United States was the only country to have the atomic bomb technology. Ted Hall wasn't caught when the FBI launched an investigation into the secrets given to the Soviets, but as an adult he said he would have made different choices, given the opportunity to do it all over.

Leslie Groves

Leslie Groves was a Colonel in the military when war broke out in the early 1940s. Having been in charge of building the Pentagon, he was selected to head up the atomic bomb project once the American government decided America had to be first to successfully build the bomb. Groves wasn't initially happy with the assignment but accepted the responsibility. He chose Oppenheimer to lead the scientists and stuck by that decision, even when others questioned it.

Klaus Fuchs

Klaus Fuchs was a German who was working on the American bomb project. He provided the Soviets with information about the process of extracting uranium for building the bomb. He was quiet and no one really paid him any attention as he continued to give all his information to his contacts to be passed to the Soviet Union. One of his earliest contacts was Harry Gold. Fuchs basically disappeared and the KGB

was initially really upset at having lost such a valuable contact. Fuchs turned up again as a member of the team working at Los Alamos on the main bomb project.

Otto Hahn

Otto Hahn was the first person to perform the experiment that proved that a neutron could cause a uranium atom to split. He initially believed the result of his experiment was somehow incorrect and that the explosion wasn't possible. Hahn was a German and he was later picked up by the Americans and British in an effort to keep him from doing further research for Germany.

Lise Meitner

Meitner was a Jewish physicist who fled Germany when Hitler took over. Hahn contacted her with the results of his uranium experiment and his conclusion that the result he got really wasn't possible. Meitner responded that physicists were just breaking the surface and really couldn't say that anything was impossible at that point. She shared the information with her nephew and the news spread from there. It was her information that first brought the discovery to the attention of the scientific community.

Werner Heisenberg

Heisenberg was one of the top German scientists of the era. When the United States debated which scientists might be working on atomic bomb technology, Heisenberg's name came to the top of the list. The Americans decided that they should kidnap Heisenberg as a means of slowing the German efforts to build a bomb. Heisenberg wasn't detailed until Germany's surrender. An interesting aspect of his character is revealed after he learned that America had dropped the atomic bomb on Japan. Heisenberg and the other scientists being held talked about the implications, including that they could have built the bomb if they'd really wanted to.

Knut Haukelid

Haukelid was a Norwegian who joined a resistance movement during the war. He was resourceful and brave which made him a prime candidate when the Americans and their allies needed to disrupt the heavy water supply to Germany. He helped when the British tried to bomb the heavy water plant from the air and eventually led the team to bomb the plant from the ground. He was also in the team that bombed the ferry carrying a shipment of heavy water to Germany.

Franklin Roosevelt

Roosevelt was one of two United States Presidents involved in this era of the bomb project. Roosevelt was the President when the science behind the atomic bomb was first discovered. The world was in chaos with Germany and Japan launching attacks against Britain and the Soviet Union. Roosevelt kept America out of the war during the early phase but that changed when Japan attacked Pearl Harbor. With that attack, Roosevelt called for a declaration of war that put America in the middle of the conflict.

Albert Einstein contacted Roosevelt by letter, alerting him of the science behind the atomic bomb and that other countries were likely to be using the technology for that purpose. Roosevelt agreed with Einstein's assessment and established a program to develop the technology. Roosevelt didn't live to see the bomb tested. When he died, Vice-President Truman was sworn in as President.

Symbols and Symbolism

The Atomic Bomb

The atomic bomb was a weapon of mass destruction. The idea of the bomb came about because of a German scientist's experiment and the news spread quickly through the scientific community. Many scientists quickly realized that the bomb was a possibility and several countries quickly began to race to be the first to develop the bomb.

Plans for the Atomic Bomb

These were documents created by American and British scientists during an era of world conflict. One set of the plans was handed over to a Soviet spy who smuggled them out of New Mexico in a tissue box. The documents were handed over to the Soviet Union near the end of the war and were used to create a bomb after the war's end.

The Pennsylvania Sugar Company

This was where Harry Gold worked when he was first recruited by the Communists. He handed off company information to the Soviets, though most of it was of little importance. This was the foundation for Gold's role in delivering secret documents related to the atomic bomb.

Enormoz

This was the code name used for the Soviet Union's efforts to steal information from the United States. The project lasted years and included many people, including Americans, British, and Germans who were willing to give information to the Soviets.

The Manhattan Project

This was the code name used for the United States' bomb building effort.

Special Training School #3

This was a training facility that Knut Haukelid attended. The soldiers who attended this program were taught things such as breaking into safes and picking locks. It was known as the International Gangster School.

The Red Scare

This was an attitude of suspicion and distrust against Communists and the Soviet Union during the 1940s and the decades following. The attitude prompted the government to watch thousands of people, many with tenuous ties to Communism who were never a threat to the United States.

The Hydro

This was a ferry boat that was used to transport heavy water bound for Germany. Haukelid and his team bombed the boat, sinking the barrels of water in a deep channel, thereby slowing down the German work on the atomic bomb.

The Gatekeeper

Dorothy McKibben was a secretary for the bomb project but she worked in a small office in Santa Fe, New Mexico. She was the first person scientists encountered when they arrived in town. She gave the new arrivals information and instructions aimed at keeping the scientists from arousing suspicions about their true purpose at Los Alamos.

The Electric Rocket

As people in Santa Fe speculated about the military's work at Los Alamos, the military tried to plant the rumor that they were building electric rockets. The disinformation failed to take hold and was basically ignored.

Settings

Los Alamos

Los Alamos was in the northern part of New Mexico. Los Alamos was a boys' school when Oppenheimer and Groves found it. They decided it was perfect for their operation and the government closed the school in order to make way for the scientists to do their work. This was a remote location not too far from Santa Fe. The scientists who were traveling to Los Alamos arrive first at Santa Fe where they were given directions to Los Alamos.

Los Alamos was literally a self-contained campus. There were some buildings when the scientists took over the property and more were built as the work progressed.

The Soviet Union

The Soviet Union was a country controlled by the Communist Part. The country was a major part of World War II and was in danger of being invaded by German forces. The Premiere, or leader, during this period was Joseph Stalin. The war took a huge toll on the people. The government had trouble meeting the basic needs of its people but Stalin promised the scientists anything they needed to build an atomic bomb. The reader gets an important look into the situation in the country in the epilogue of the book. Scientists created a bomb with the plans stolen from the American project. Those who worked on the project feared that the bomb would be a failure, and they fully expected their government would execute them if that happened.

Hiroshima, Japan

This was the first city bombed by the Americans with an atomic bomb. The city was typical of the place and time, and people were going about their normal daily routines in the moments before the bomb was dropped. There were some 76,000 buildings before the bomb and only about 6,000 survived. Thousands died in the blast and thousands more died from injuries and radiation after the blast.

Farm Hall

This was an estate in England where German scientists were taken after German surrendered. The estate is in a remote area and the scientists are not told where they are. The scientists are given many freedoms there, even to the point of being allowed to play games and visit each other, but they are not allowed to leave. The point of this isolation is to keep the scientists from working on atomic science.

Oak Ridge, Tennessee

As work continued on the bomb, the scientists needed more materials, especially plutonium and a specific kind of uranium. In Oak Ridge, Tennessee, a plant was established to separate the uranium into a usable form. There is not much detail about the area other than the fact that the plant was operating in an unsafe manner until a scientist named Richard Feynman arrived to help correct the problems and set up safer processes.

Themes and Motifs

World War II's Effect on the World

The atomic bomb was created during World War II and the world politics of the day was the factor that prompted the United States and Britain to throw themselves into building the atomic bomb. Other countries began to work on the project as well, though America was the first to have possession and control. Britain sent scientists to help the United States. As allies in the war against Germany and Japan, Britain and the United States agreed to work together on the project. Because Britain was under constant attack, British officials agreed that the actual work should be done in the United States.

The war began with Adolf Hitler's programs, which included ethnic cleansing. He began to push his armies into other countries and it became evident that he was determined to take over a large part of the world. Britain and the Soviet Union allied against Germany while Japan joined the Germans. America helped Britain by providing guns and other supplies, but didn't join the war until the Japanese attacked Pearl Harbor. After that attack, America declared war, allying themselves with Britain and the Soviet Union. Germany surrendered first and Hitler committed suicide. With Germany out of the picture, the Soviet Union declared war on Japan. The Japanese refused to surrender even after the United States dropped an atomic bomb on Hiroshima, killing thousands and destroying the city. President Truman told the Japanese people that the United States would drop another bomb on Japan unless they surrendered. Japanese leaders were split on the issue but the country refused to give up. The United States dropped another bomb on a major Japanese city and Truman indicated that the bombing would continue until the Japanese surrendered. This time, the Japanese emperor – who was seldom a part of these kinds of decisions – intervened. He insisted that Japan surrender rather than allowing more of that kind of total destruction. Ironically, America didn't have another bomb yet available at the moment of Japan's surrender.

From the beginning, most countries realized the danger of allowing Germany to win the war. The Soviet Union and Britain were under direct attack from Germany and Japan. At times, the outcome of the war was not clear. Even after America formally joined, it remained possible that Germany and Japan would actually win the war. With this in mind, the theory of creating an atomic weapon became a driving force for every country. If Germany had managed to be first to create the weapon, it would likely assure victory for Hitler. That made it imperative that American and its allies be the first to create and control the atomic bomb.

The politics of the war drove decisions and situations in several countries. Truman's advisers told him that dropping the bomb on Hiroshima would bring a speedy end to the war, lessening the number of American troops killed in battle. He used that as justification to drop the bomb. Truman was faced with Japan's refusal to surrender, even after the atomic bomb destroyed Hiroshima. An official suggested that he offer Japan different terms of surrender, including the option of keeping their emperor in place.

Truman said the American people would insist on Japan's total surrender, and he used that as justification to drop the second bomb.

The Power of the Atomic Bomb

From the first discovery that splitting uranium atoms could cause the release of energy, scientists began to consider the possibility of creating a bomb. The first experiment to prove this theory happened in Germany. The scientist created the experiment and was surprised at the results. He initially thought there must be a mistake. As soon as it became clear that the experiment was correct, scientists were certain that a large amount of uranium would cause a huge explosion, making the atomic bomb the most powerful weapon on earth.

At least one scientist felt that the United States should not be the only country to own the technology. This attitude created an opportunity for the Soviet Union and the scientist turned the plans over to the Soviet Union. Other scientists quickly realized that there could be larger and more powerful bombs, but that the result would be an all-out arms race that had no end.

America was the first to test the bomb, largely because of Robert Oppenheimer's leadership. He was frantically nervous in the days and hours leading up to the test, and even tried to put it off. When the bomb detonated, he was initially relieved that the test was a success. All the scientists echoed his initial reaction. Then they all began to comprehend the power of the bomb that they had created. Many were shocked. They'd calculated the resulting blast in theoretical terms, but seeing the actual blast made them realize that they'd truly created the most powerful weapon known to man. They all knew that this would change how the world fought wars, and that there was a potential for countries to totally annihilate each other.

America was first to create a working atomic bomb and threatened Japan with the bomb, hoping that Japan would surrender. Even though Germany had already surrendered and Hitler was dead, Japan refused. America dropped the bomb on Hiroshima, decimating the city. Japan still refused and America dropped a second bomb with a statement that they would continue until Japan gave up. America didn't have another bomb ready but Japan didn't know that, and the Japanese leaders reluctantly agreed to surrender.

While the physical power was enormous, another important aspect of this theme is seen in the impact on the attitudes of the world. This was a tumultuous time in world history. There was political and military upheaval, and several countries were hoping to emerge from the war as a superpower. This prompted secrecy and a race to be the first to create the bomb. Every major country in the world desperately wanted a bomb of their own. The Soviet Union spent a great deal of time and money recruiting anyone who might turn over information about the bombs. Governments promised their scientists unlimited resources to research and build an atomic bomb, even while the people were facing hardships and deprivation.

Robert Oppenheimer's Role

Oppenheimer's role in the creation of the atomic bomb is a major theme in the story. He is the the driving force that puts the Americans at the front of the arms race, and he works after the war to fight against creating more and bigger bombs. To fully understand his role, it's important to understand his character.

Oppenheimer was somewhat forgetful and easily distracted when it came to everyday things but was totally focused on science. There was a story told in which he left a young woman sitting in his car and forgot that the woman was in the car. He didn't even notice a stock market crash but quickly focused on the idea of fission. When he realized that the atomic bomb was a possibility, he also realized that scientists in other countries would come to the same conclusion. With World War II threatening societies all over the globe, Oppenheimer felt he had to do something to help. This prompted his early work on the atomic bomb, even before the United States recruited him to lead the scientists working on the project.

Once he was in charge of overseeing the project, Oppenheimer threw himself into the work. He wandered from one lab to another and always knew what was going on in every lab. As he worked, he focused only on the science involved. He was brilliant and therefore knew well ahead of time the power of the bomb. Despite having the information, it wasn't until the successful test of the first bomb that he fully realized what his team had created.

After the bombs were dropped on Japan, Oppenheimer went to President Truman and basically begged forgiveness for his role in building the bomb. He said that he had blood on his hands and was obviously in emotional pain over his role in killing so many people. Truman had no sympathy for Oppenheimer's pain. While the bomb was just a theory, Oppenheimer believed the United States had to be the first to achieve a working bomb.

After World War II, Oppenheimer believed that nothing good would come from an all-out arms race. He pleaded with Truman to stop building bombs and to stop trying to create more powerful bombs. He was so outspoken in his views that his opponents called for an investigation. They argued that Oppenheimer was trying to slow America's work on weapons to give Communist countries a head start. Though there was no real evidence that Oppenheimer had Communist sympathies, the investigation resulted in Oppenheimer losing his government clearance, ending his role in any work or decisions related to the atomic bombs. Oppenheimer's attitude at this time was considered unacceptable but people later came to the conclusion that he was correct in his attitude. Later, the world's attitude came to mimic Oppenheimer's. In modern times, the world's major countries have adopted this attitude and weapons are regulated by mutual agreement.

The Effects of Atomic Weapons

When Americans first realized that a German scientist had discovered the basis for the atomic bomb, American leaders and scientists set out to create a bomb of their own. The goal was clearly to win the war. The fear was that Germany would create a bomb first and that they would use it to make Germany into a superpower. Germany might have succeeded if they had the right materials and if American scientists hadn't been given everything they needed to make the bomb work. The short-term effect of the atomic bomb was that Japan surrendered. There were several long-term effects.

One of the most important was the Cold War that developed between America and the Soviet Union. The Soviets got copies of America's work on the atomic bomb which put them in a position to make their own. They successfully created and tested a bomb soon after the end of the war. Tensions between America and the Soviet Union remained high for years as each feared the intentions of the other, based at least partly on their continued production of atomic weapons.

Robert Oppenheimer foresaw this and predicted an even bigger problem if every country was able to create weapons of mass destruction without any limitations. He pleaded with Truman to stop making bombs. Truman argued that other countries were making bombs and that America's only recourse was to make more bombs as well. Truman felt another country would be less likely to attack if America had an arsenal of bombs with which it could retaliate. Oppenheimer could see no end to the building of bombs, if that mindset continued. When scientists successfully tested a hydrogen bomb, Oppenheimer and others renewed their objections.

One of the biggest problems is that almost every country now has atomic weapons available. The fallout of even a small atomic bomb could cause mass devastation for the entire world. The author points out the constant unrest in the Middle East. Though there are only a few atomic weapons there, it seems feasible that any two of the countries involved might fire weapons at each other. Another possibility for modern-day problems is an accident. The weapons might misfire, fire accidentally, or explode in their bunkers. Any of those could cause mass destruction. The author goes on to explain that there are some safeguards in place, including limitations and mutual agreements between countries to limit the type and number of weapons.

Communism

America's Federal Bureau of Investigation kept active surveillance on many people during World War II and in the decade following the end of the war. There were some legitimate fears, including the worry that Communists from the Soviet Union might find a way to steal America's work on the atomic bomb and other military weapons. That fear became a reality though the FBI was not able to stop it from happening.

The Soviet Union's economy was in trouble during the war. The government had trouble meeting the basic needs of its people but continued to work on the bomb. At one point,

Soviet Leader Joseph Stalin promised to give scientists anything they needed in order to further the research. It was too late for the Soviet scientists to create a bomb that would help in their war against Germany, but they did use stolen secrets to build a bomb after the end of the war.

Throughout the early 1940s, the Communists worked to gather information about the American bomb project. Though the Communists were actively recruiting Americans, they were also recruiting anyone who lived and worked in the United States, including some British people who were working on the bomb research. Most of the time, the recruiters touted the idyllic way of life Communism created. They talked about ending greed and corruption, and said that Communism was the answer to those problems. While some people may have bought into that idea, the smart people who really observed the way of life in the Soviet Union soon realized that this was all propaganda. As an interesting note, at least some of the people who handed over secrets related to the atomic bomb were not interested in Communism. They were merely worried that America would become too powerful if the United States was the only country with the bomb.

There were lists of people who might be Communists or who might be sympathetic to Communism. The FBI watched as many of these people as possible. They took note of everyone these people met with and assumed these people might also be Communists. With this approach, the list grew to astronomical proportions. It became known as the Red Scare and the attitude lasted for years after the end of the war.

Oppenheimer's loyalty was repeatedly questioned though he put his entire life on hold to work on the atomic bomb. When the war was over, Oppenheimer continued to work on another bomb project. Scientists theorized that a hydrogen bomb was possible and that it would be even more powerful than the atomic bomb. Oppenheimer felt this wouldn't keep America safe because other countries, including Communist-based societies, would feel the need to make bigger bombs of their own. He pleaded with the government to shut down those experiments, saying that the bomb was too powerful and that other countries would feel the need to build a bomb just as powerful. Many people today agree with Oppenheimer's arguments but it wasn't a popular opinion during this time. Oppenheimer's insistence that the government put a stop to the bomb research prompted yet another investigation into his loyalties. Some argued that he was trying to keep America from new discoveries because he supported the Communist Soviet Union. He was eventually shut out of bomb projects but continued to insist that he was loyal to the United States.

Styles

Point of View

The majority of the book is written from an omniscient perspective. The perspective is technically from the author's point of view but he refers to himself and to the reader only a couple of times, giving the book an overall feeling of a third-person perspective. The book is a historical account of a specific subject – the discovery, building, and use of the atomic bomb. The story focuses on the events that happen during World War II when the Americans and Great Britain joined forces to build the bomb. The final section of the book goes on to look at events after the war, including the modern-day situation and possible repercussions.

In the final section, the author speaks directly to the reader. This makes it clear that the author has been in control of the perspective for the entire book, though he doesn't use first person or address the reader directly during the body of the book.

The information appears to be historically accurate but the author seems to be against the use of atomic weapons. He talks about the potential fallout from even a few bombs being used and points out that the nuclear arms race has created an unsafe world. There are some people who argue that the United States has created weapons merely to defend its people, but the author doesn't present any of that information. While many people would agree with the author's perspective on this subject, it does force the reader to decide whether he is a credible perspective. It's left to the reader to decide.

Language and Meaning

The book is presented in modern-day English. The language is sometimes very technical and there is a great deal of scientific information presented. For example, the author writes about the chemical processes involved in making an atomic reaction, in creating an atomic bomb, and is creating Plutonium that was used in some of the bombs. These are technical and detailed descriptions, and some readers may not fully follow the information. The bigger part of the story is the creation of the bomb, the driving powers behind that project, and the reactions to the successful completion. The reader doesn't have to understand all the technical scientific information to follow the main story.

There are many people in the story. Again, these are historically correct and are necessary to fully understand all the events of the story. The casual reader may have trouble keeping up with the huge cast. The author helps with this by repeatedly identifying key characters through previous events. Many readers will find this helpful.

The majority of the story is presented in narrative though there are some quotes. These seem to be direct quotes and the author includes a list of sources for the information in the book. The quotes may not be exact but seem reasonable for the story.

Structure

The book is divided into 4 sections. Part 1: Three-Way Race; Part 2: Chain Reactions; Part 3: How to Build an Atomic Bomb; and Part 4, Final Assembly. Part 1 has 7 chapters. Each is titled with words rather than numbers. They are Skinny Superhero; The U Business; Finding Einstein; Tradecraft; Rapid Rupture; Norway Connection; and Enormoz. Part 2 has 8 chapters. They are On the Cliff; International Gangster School; Gliders Down; Quiet Fellow; Disappearing Scientists; Chicago Pile; Operation Gunnerside; and High Concentration. Part 3 has 9 chapters. They are The Gatekeeper; The Gadget; Laboratory Number 2; Ferry Job; Dirty Work; Secret Cities; Man with Four Gloves; Born Rebel; and Two Inside. Part 4 has 13 chapters. They are The Pilot; Swiss Deal; Implosion; Falling Stars; Land of Enchantment; Trinity; Test Shot; Little Boy; Hiroshima; Reaction Begins; End Game; Father of the Bomb; and Fallout.

There are several additional sections. The Prologue introduces Harry Gold, a major player in the attempt to steal the atomic bomb technology being produced by the United States. The Epilogue is titled Scorpions in a Bottle and it details information about some of those involved in the plan to steal the atomic bomb technology, including Harry Gold, Klaus Fuchs, and Ted Hall. This section also talks about hydrogen bombs and the race to develop other weapons after World War II. A section that follows the Epilogue is called Race to Trinity. It includes a copy of Alber Einstein's letter to President Roosevelt, outlining his thoughts on the atomic bomb and the fear that Germany might be building this kind of bomb. This section also includes photos of the Trinity test and some of the people involved.

There are photos of various people involved in the discoveries and the building of the atomic bomb. These photos show ordinary people who created an extraordinary technology that changed the course of history. There are also a few diagrams aimed at helping the reader understand the information being presented.

Quotes

My life as a child did not prepare me for the fact that the world is full of cruel and bitter things.
-- Robert Oppenheimer (Skinny Superhero paragraph 15)

Importance: Oppenheimer is describing himself as a child and says that he was a “repulsively good little boy.” He obviously worked hard to obtain his degree and to reach his place as a professor at Berkeley. Later, he leads the program to build the atomic bomb and is horrified by the devastation of his creation.

I feel as if I had caught an elephant by its tail, without meaning to,' Frisch wrote to his mother. 'And now I don't know what to do with it.
-- Otto Frisch (The U Business paragraph 20)

Importance: Frisch was a physicist and Lise Meitner's nephew. The two discussed Otto Hahn's discovery related to the splitting of atoms and came up with the science that made the atomic bomb possible. Frisch realized that the possibility now existed to create an incredible weapon and he was able to see ahead far enough to know the bomb would come with serious implications.

Black told Gold that the Soviet government had abolished private property and was making all the decisions about what the economy should produce, and how goods should be distributed. In this way, Black said, the Soviets would soon wipe out the greed and poverty plaguing countries like the United States.
-- Narrator (Tradecraft paragraph 13)

Importance: This is a common argument for Communism and it often sways people to believe that a Communist rule would create a country of prosperity. Ironically, Gold isn't really caught up in the idealism of Communism. He just likes Tom Black and feels he owes him something for helping Gold get a job.

For that moment on, he decided to forget about politics and discussion groups. He decided to pour all his energy into beating Hitler in the race for the atomic bomb.
-- Narrator (Rapid Rupture paragraph 36)

Importance: “This moment” refers to the Japanese attack on Pearl Harbor. Oppenheimer, like most Americans, was outraged by the vicious attack. Up until that point, Oppenheimer had been involved in discussion groups that explored the feasibility of creating the bomb. Now, he was determined to create one, if it could be done.

If the Soviets were going to get an atomic bomb any time in the near future, they were going to have to steal it. That was a job for the KGB.
-- Narrator (Enormoz paragraph 8)

Importance: A Soviet physicist named Georgi Flerov was looking for information about

the atomic bomb research. He knows it's going on but can't find any news articles. He knows that means the research is being closely guarded. The Soviets are in danger because Hitler's army is very near.

Besides, his number one worry was to build an atomic bomb before Hitler did. For this, he said, 'Oppenheimer is irreplaceable.
-- Narrator (Laboratory No. 2 paragraph 11)

Importance: Military intelligence had seen Oppenheimer visiting a girlfriend who was a member of the Communist Party. He spent the night with her and the military intelligence believed that meant he was not trustworthy. Groves believed in Oppenheimer's loyalty from the beginning and he didn't doubt it now. He basically said that it was up to the military to keep the information secret but he felt that Oppenheimer was a necessary member of the team, if the United States was going to be the first to build the bomb.

No one guessed that their shy, pale coworker was capable of leading a double life.
-- Narrator (Quiet Fellow paragraph 15)

Importance: The Narrator is talking about Klaus Fuchs, a German-born scientists who was recruited to work on the bomb project. Fuchs said later that he'd tried to keep mainly to himself, not wanting to make friends among the team that he was betraying. This is an example of the fact that ordinary people were working as Soviet spies.

Wouldn't the world be safer if a second major power also knew how to build atomic bombs? That way, neither country would use the bomb – knowing they'd have the bomb used on them.
-- Ted Hall (Born Rebel paragraph 33)

Importance: This was Hall's motivation for giving the bomb information to the Soviet Union. He felt sympathy for the Soviet Union because the country had been embroiled in war, but he was also thinking about the possibility of America being the only country with the bomb. Hall later said he was arrogant to think he should be the person to change history.

Tibbets learned the basics of how the atomic bomb would work and approximately how powerful the explosion might be. Using this information, it was his task to devise a strategy for flying the bomb over enemy territory, releasing it on the target and getting away before the massive blast killed everyone in the plane.
-- Narrator (The Pilot paragraph 23)

Importance: Paul Tibbets was the pilot of the Enola Gray and his crew was selected to drop the first bomb on Japan. While he was told about the bomb's power, he was very much like others in that he didn't fully expect the devastation that actually happened.

It was the chill of knowing they had used something they loved – the study of physics – to build the deadliest weapon in human history. Oppenheimer was feeling the chill too.

-- Narrator (Test Shot paragraph 71)

Importance: This was the reaction right after the test of the first bomb. The scientists were initially relieved that the bomb worked, but then they fully realized that they'd changed the course of history and that war would never be the same, because of the bomb they'd each helped create.

The use of a second bomb the same week,' he said, ' was calculated to indicate that we had an endless supply of this super weapon for use against one Japanese city after another.
-- Paul Tibbets (Reaction Begins paragraph 77)

Importance: America was hoping for an emotional advantage over Japan by hinting that they could keep dropping the bombs until Japan surrendered. In fact, there were only two bombs available, including the one that had already been dropped on Hiroshima.

We may be likened to two scorpions in a bottle,' Oppenheimer wrote in a 1953 article, 'each capable of killing the other, but only at the risk of his own life.
-- Robert Oppenheimer (Epilogue paragraph 50)

Importance: This was Oppenheimer's attitude about the arms race. He felt it was dangerous for the countries to build bigger bombs because it only prompted other countries to build bigger bombs of their own, and he felt it would never end.