Chapter 1

Introduction

Biographical Sketch[1]

Robert Oppenheimer, the son of Julius and Ella (Friedman) Oppenheimer, was born in New York City on April 22, 1904. His father emigrated from Germany to the United States in 1888 at the age of 17, and became a very successful textile importer. His mother, born in Baltimore, had studied art in Europe and was an accomplished painter and teacher of art. Robert was raised in an atmosphere of culture and wealth — a spacious apartment on Riverside Drive overlooking the Hudson River with maids and a chauffer, a summer home on Long Island, family trips to Europe, and a 28-foot sloop for Robert about a year before his high school graduation. His younger brother Frank, who would also become a physicist, was born in 1912.

The Oppenheimers were an emancipated Jewish family who belonged to the Ethical Culture Society founded by Felix Adler in 1876. The Society was nonsectarian and emphasized moral dialogue and instruction with a commitment to charitable work and progressive social reform; that is, "Deed, not Creed." Robert's parents had been married by Adler and his father was a member of the board of trustees of the Society for a number of years.

From 1911 to 1921, Robert attended the Society's private school called the Ethical Culture School, located next to Central Park. Young Robert, delicate and physically awkward, excelled even relative to his gifted and motivated peers. Taken as distant and sometimes difficult by fellow students, he was precocious — an "adolescent

polymath."[2] Years later, Helen Rabi, who had attended school with Robert, "recalled that by the seventh grade he was universally recognized as an intellectual phenomenon."[3] In 1926, Helen married I. I. Rabi, who later became a close friend and colleague of Oppenheimer and won the 1944 Nobel Prize for Physics.

Robert had developed a scientific bent early on. In particular, he always felt indebted to his chemistry-physics teacher Augustus Klock, with whom he helped set up laboratory equipment and went on occasional field trips collecting minerals, "for having set him on the road to science."[4] But young Robert's life was a very sheltered one. Looking back years later, Oppenheimer recalled that "My life as a child did not prepare me in any way for the fact that there are cruel and bitter things."[5]

Robert graduated from the Ethical Culture School in the spring of 1921. That summer on a family trip to Germany, Robert contracted a life-threatening case of trench dysentery. He had to postpone his enrollment at Harvard University until the fall of 1922. In the summer of 1922, as part of his recuperation, he went on his first trip to the Southwest with Herbert Smith, his high school English teacher. Oppenheimer thoroughly enjoyed the adventure — fresh air, beautiful vistas, physical challenges — which afforded a positive and transformative experience for the frail and socially awkward adolescent. While horseback riding in the New Mexico wilderness, Oppenheimer and his companions would gaze upon the Los Alamos (Spanish for "The Poplars or Cottonwoods") mesa where twenty years later he would direct the atomic bomb project.

Oppenheimer entered Harvard in the fall of 1922 and graduated *summa cum laude* three years later in 1925 with a degree in chemistry. He took a wide variety of courses from philosophy and French literature to graduate courses in physics. He even took a course with eminent mathematician and philosopher Alfred North Whitehead, working through *Principia Mathematica* written by Whitehead and Bertrand Russell. Though his degree was in chemistry, it was physics where he found his home. In fact, Percy Bridgman, who would win the 1946 Noble Prize for Physics, was a primary influence on Oppenheimer. Having taken courses from Bridgman as well as

working in his laboratory, Oppenheimer had decided to pursue a doctorate in experimental physics.

In September 1925, Oppenheimer set sail for England where he had been accepted at the Cavendish Laboratory at the University of Cambridge. This would be a disappointing and dark time for Oppenheimer, still in many ways an adolescent. He discovered that he did not have the interest or competence to become an experimentalist. But by early 1926, things were looking up because Oppenheimer had found that his interests and abilities lay in theoretical physics. He "became friends with the influential Cambridge physicists Paul A. M. Dirac and Ralph H. Fowler. … [who] were the theoreticians and helped to broaden Oppenheimer's view of the field."[6] He was reading Werner Heisenberg and learning the new developments in quantum mechanics, and would meet the great Danish physicist Niels Bohr, who visited Cambridge later that spring. Bohr surely impressed the young Oppenheimer, and would come to have a profound influence on both Oppenheimer and his thought. In May 1926, Oppenheimer submitted his first paper entitled "On the Quantum Theory of Vibration-Rotation Bands" for publication.

That summer while visiting Cambridge, Max Born, who would win the Nobel Prize for Physics in 1954, invited Oppenheimer to pursue his doctorate at the University of Göttingen in Germany, a major center for theoretical physics and quantum mechanics. Less than a year later in March 1927, and less than five years after he had first entered Harvard as an undergraduate, Oppenheimer received his doctorate from Göttingen. By the summer of 1927, Oppenheimer published or completed the work for at least seven additional publications including work on the quantum theory of continuous spectra and the quantum theory of molecules using what is now called Born–Oppenheimer approximation, which mathematically separates nuclear and electronic motions.

He "spent the next two years, one in the U.S. and one in Europe, as a National Research Council (NRC) Fellow."[7] He interacted with the great physicists Paul Ehrenfest in Leiden and Wolfgang Pauli in Zurich. Oppenheimer and Rabi, also an NRC fellow, first met in 1928 in Leipzig. While an NRC fellow, Oppenheimer completed an

additional seven papers. One, submitted in March 1928, predicted the phenomenon of quantum tunneling by showing "that a weak electric field could dislodge electrons [electron emission] from the surface of a metal."[8] Today, in the context of radioactive decay by alpha emission, the prediction of quantum tunneling is usually credited to George Gamow and, independently to Edward Condon and Ronald Numbers. But as pointed out by physicist and historian John Rigden, this is incorrect since Oppenheimer's paper predated their papers by several months.[9]

Oppenheimer returned to the United States in the summer of 1929, and would not return to Europe for nearly two decades.[10] Oppenheimer, only 25 years old, was in great demand especially in America — with a German doctorate, an international reputation, and at the forefront of the quantum revolution. With perhaps ten offers from American universities, he accepted a joint appointment at the University of California at Berkeley and the California Institute of Technology at Pasadena, typically spending the fall and winter at Berkeley and the spring at Caltech.

In less than a decade, he would make Berkeley the major center for theoretical physics in the United States, and in the words of Hans Bethe who won the Nobel Prize for Physics in 1967, "J. Robert Oppenheimer did more than any other man to make American theoretical physics great."[11] During his California years, Oppenheimer did fundamental research in theoretical physics and worked in close collaboration with experimental physicists, for example, Ernest Lawrence and his Radiation Laboratory. Of particular note is a 1930 paper by Oppenheimer that "practically predicted the positron [the antiparticle of the electron] three years before its discovery by Carl Anderson."[12] In addition, Oppenheimer made significant contributions to the understanding of cosmic ray showers, meson theory, and nuclear reactions (e.g., Oppenheimer–Phillips process).

Most fascinating, as discussed in detail by Ray Monk, Oppenheimer in the late 1930s published three papers on astrophysics, each with a different co-author (i.e., two of his students along with his younger colleague Robert Serber).[13] These papers investigated neutron stars and gravitational collapse — what later became known as black holes.

This series of papers was groundbreaking, but largely neglected for nearly thirty years. Physicist and biographer Jeremy Bernstein has called the third paper in this series "one of the great papers in twentieth-century physics."[14] According to Monk, "Many people think that, if he had lived a little longer, Oppenheimer would have received the Nobel Prize for these papers."[15] The Nobel Prize, of course, can only be given to a living person, and Oppenheimer died in 1967 at age 62.

Beginning in 1936, Oppenheimer's interests took on a new dimension. Before this, he had little interest in social issues and politics. He did not read a newspaper, did not have a radio, and voted for first time in the 1936 presidential election. In large part because of his romance with Jean Tatlock as well as the world depression and the rise of Fascism in Europe, Oppenheimer became involved in left-wing social and political issues. For example, he donated funds to the Loyalist cause in the Spanish Civil War and was active in the East Bay Teacher's Union.

A daughter of a Berkeley English professor, a graduate of Vassar, and training to be psychiatrist, Tatlock was an "on again, off again" member of the communist party.[b] Oppenheimer's brother Frank and his wife had also joined the communist party. In 1939, Tatlock and Oppenheimer finally broke up. In the summer of 1939 in Pasadena, Oppenheimer met Katherine "Kitty" Puening and they were married in November 1940. They would have two children — a son Peter and a daughter Katherine "Toni." One of Kitty's former husbands, Joe Dallet, had been a member of the communist party and had died fighting in Spain, and she had been a party member for about two years (1934–1936) during the first part of their marriage.[16]

Robert Oppenheimer was certainly a fellow-traveler during the 1930s, but he steadfastly denied that he was ever a member of the communist party. In fact, in his March 1954 letter (which was read

[b]For a wonderful and well-researched book on the three women whom Oppenheimer loved and who "gave shape to his life," see Shirley Streshinsky and Patricia Klaus, *An Atomic Love Story: The Extraordinary Women in Robert Oppenheimer's Life* (Nashville, TN: Turner Publishing, 2013). The three women are Jean Tatlock, Kitty Oppenheimer, and Ruth Tolman.

into the record of his 1954 security hearing) replying to the official letter which informed him of the suspension of his security clearance, Oppenheimer stated and in effect testified that he "was never a member of the [communist] party, concealed or open."[17] Oppenheimer scholars Kai Bird and Martin Sherwin agree with Oppenheimer while Gregg Herken holds that he was a secret member during the 1930s. In any case, all agree that Oppenheimer was not a spy and was loyal to the United States.[c]

With the discovery of nuclear fission in December 1938 in Germany and the outbreak of World War II in September 1939 when Germany invaded Poland, the possibility of atomic weapons began to take center stage. With the shock of the Japanese attack on Pearl Harbor in December 1941 and the entry of the United States into the war, the race to build the atomic bomb was on. Oppenheimer had already been involved in research into nuclear fission by early 1941, and was officially appointed director of fast-neutron research as related to the atomic bomb in May 1942. Five months later in October, General Leslie Groves, who was in charge of the Manhattan (Atomic Bomb) Project, selected Oppenheimer to be the scientific director of the central laboratory dedicated to the development of an atomic bomb. In November while on an official trip, Oppenheimer showed Groves Los Alamos, and the general quickly decided that this would be the site for the secret laboratory to build the bomb.

Appointing Oppenheimer as scientific director of Los Alamos was a bold and controversial move on Groves' part. Oppenheimer was a theoretician with no administrative experience organizing

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[c]For a discussion of Soviet spying and Oppenheimer, see Gregg Herken, "Target *Enormoz*: Soviet Nuclear Espionage on the West Coast of the United States, 1942–1950," *Journal of Cold War Studies* **11** (Summer 2009). In his article using evidence from the "Soviet State Security Committee (KGB) documents transcribed in Alexander Vassiliev's notebooks," Herken makes a convincing case that "Oppenheimer was never a spy" (p. 84) even though "the KGB had a growing interest — and, ultimately, a near obsession — with recruiting Oppenheimer." (p. 78) Herken's conclusion is reconfirmed in John Earl Haynes, Harvey Klehr, and Alexander Vassiliev, *Spies: The Rise and Fall of the KGB in America* (New Haven & London: Yale University Press, 2009), p. 58.

experimental, let alone engineering, work. In addition, Oppenheimer lacked a Nobel Prize and had a questionable background from the perspective of military intelligence. However, Groves insisted on the appointment and, in the end, was proved right. In July 1945, the first atomic explosion was conducted in the deserts of New Mexico. Less than a month later, on August 6, an atomic bomb destroyed Hiroshima and three days later another leveled Nagasaki. The next day the Japanese offered to surrender and a few days later the war was over. In the view of historians as well as his wartime colleagues, Los Alamos owed much of its success to Oppenheimer's inspiration and leadership as well as his scientific brilliance and understanding.[18]

With the end of war, Oppenheimer was heralded as "Father of the Atomic Bomb" and became an international as well as national figure, and was awarded the Medal of Merit by President Truman for his work at Los Alamos. In October 1945, he officially resigned as the director of Los Alamos, and returned to California in November to resume teaching. Though his personal research in physics effectively ended in 1942 with his work on the atomic bomb, Oppenheimer would continue to stay up with physics and would influence its development. In 1947, he became director of the Institute for Advanced Study in Princeton, and continued in this position until June 1966.[19] Oppenheimer died of throat cancer eight months later on February 18, 1967.

Immediately after the war, Oppenheimer became an influential voice in Washington and played a leading role in shaping atomic policy. In particular, he had a central role in formulating the Acheson–Lilienthal Report, which will take on a significant and illuminating role in our later exploration of Oppenheimer's thought. This report provided the framework for the proposal by the United States presented to the United Nations for the international control of atomic energy. In particular, it would abolish atomic weapons from national arsenals, and hence lead to nuclear disarmament and "a world free of nuclear weapons." From 1947 to 1952, Oppenheimer also served as chairman of the powerful General Advisory Committee (GAC) to the Atomic Energy Commission (AEC). The GAC is noted for its opposition to a crash program to develop the hydrogen (thermonuclear)

bomb as an answer to the successful atomic test by the Soviet Union in August 1949, which broke the American atomic monopoly. Instinctively and somewhat precipitously, President Truman rejected the recommendation of the GAC, and the United States proceeded with its crash program and exploded its first thermonuclear device in 1952. In addition, Oppenheimer served as a consultant on continental defense, civil defense, and the use of tactical nuclear weapons.[20]

By 1952, Oppenheimer's influence was waning. He resigned from the GAC in August 1952 and Rabi became its new chairman.[21] In November, the Republicans won both the presidency and took control of the Senate and House. In the fall of 1953, Oppenheimer gave the BBC Reith Lectures in England. Shortly after his return from Europe, Oppenheimer was informed on December 21 by AEC chairman Louis Strauss, one of his archenemies, that his security clearance had been suspended. Oppenheimer requested a hearing before a personnel security board. The ruling of this confidential hearing (though much of the transcript was publicly released shortly thereafter), which lasted more than three weeks during April and May of 1954, was a 2 to 1 decision to uphold Oppenheimer's suspension. The AEC commissioners agreed with the board's upholding of the suspension by a vote of 4 to 1. The loss of his security clearance in conjunction with the humiliation of the hearing was a jarring blow for Oppenheimer.

Due to his powerful influence on policy decisions, and in part his own personality, Oppenheimer was a polarizing figure and had made powerful enemies in the government (e.g., Louis Strauss), the military (e.g., the Air Force), the scientific community (e.g., Edward Teller), and the press (e.g., the Luce publishing empire). For his enemies, Oppenheimer's behavior was bewildering even suspicious, especially his opposition to the H-bomb. Given his left-wing past and unwise actions on his part (e.g., the "Chevalier incident"),[d] he thus

[d]Haakon Chevalier, a member of the American Communist Party, was a French professor at Berkeley and a close friend of Oppenheimer. In the winter of 1942–43 at Oppenheimer's home in Berkeley, Chevalier "passed on a feeler as to whether Oppenheimer would provide information [about the atomic bomb project] to the Russians through a Soviet consular official in San Francisco. Oppenheimer immediately refused, but he delayed several months before reporting the feeler to Army

proved an inviting target for those who saw him as a danger to national security. For others, Oppenheimer became the most prominent victim of McCarthyism.

In 1963, President Lyndon Johnson presented Oppenheimer the prestigious Enrico Fermi Award of the Atomic Energy Commission. Though perceived as making amends, this gesture was seen in large part as an attempt at rehabilitating Oppenheimer's public reputation. There is a touch of irony here since Teller, one of Oppenheimer's archenemies, received the Fermi Award the year before. Over his career both in and out of science, Oppenheimer received numerous awards and honors — including being elected a member of the National Academy of Sciences and Royal Danish Academy of Sciences, and a fellow of the American Academy of Arts and Sciences and the American Physical Society.

Oppenheimer's loss of his security clearance marked the end of his work as a government adviser. Of course, Oppenheimer continued his work as director of the Institute for Advanced Study. Just as important, he persisted in being a spokesperson for science and more generally a public intellectual — speaking at innumerable events, celebrations, and conferences together with publishing articles and lectures. His opinions and views were widely covered in the public media. Combining eloquence with a lasting authority based on his leadership of the Manhattan Project, Oppenheimer endured as an interpreter of science and its new relationships to society. Most important, he still spoke as an interpreter of the atomic revolution and offered hope for transcending the atomic crisis.

Biographers and commentators have highlighted and explored several biographical themes and interpretations for understanding Oppenheimer and his historical significance. One is certainly Oppenheimer's dedication to and love of science, especially physics. His active involvement and contributions to physics during its revolutionary

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intelligence and then lied about the circumstances in the hope of protecting Chevalier [and possibly others, as well as alerting Army intelligence]." (McMillan, *Ruin of J. Robert Oppenheimer* (ref. 234), p. 192) The "Chevalier incident," along with lying about it, played a crucial role in the AEC Board justifying its decision not to reinstate Oppenheimer's security clearance and hence causing his political downfall.

period in the first half of the 20th Century was instrumental in forming his personality, reputation, and philosophical thought about science. Biographer Ray Monk dedicates a significant part of his book to Oppenheimer's scientific endeavors, and explores how Oppenheimer's life "was shaped and driven by his desire to understand physics."[22] As noted by many, Oppenheimer's dedication to and success in bringing modern theoretical physics to America in the 1930s — making American physics a rival to European physics that would surpass it in the 1940s — is historically important. For physicist and biographer Abraham Pais, this was "the most important contribution of his life."[23]

Another theme for understanding Oppenheimer is his love for America and lifelong patriotism. George Kennan, diplomat and close friend of Oppenheimer — and defender of Oppenheimer at his security hearing — was the concluding speaker at the Oppenheimer memorial service in 1967. Kennan insisted the "truth is that the US Government never had a servant more devoted at heart than this one, in the sense of wishing to make a constructive contribution." Furthermore, Kennan recalled that shortly after the 1954 security hearing, he "had asked Oppenheimer why he hadn't left the country, noting that he would be welcomed in 'a hundred academic centers' around the globe." Oppenheimer replied with tears in his eyes, "Damn it, I happen to love this country."[24] Kennan's affirmation stands in stark contrast to Oppenheimer's political enemies who accused him of being a closet communist attempting to undermine the national security of the United States. Like other biographers, Monk stresses "the importance of Oppenheimer's deeply felt and lifelong patriotism." For instance,

> In the 1930s he had set out to build an *American* school of theoretical physics that would enable the USA to replace Germany as the leading centre for research in that area; now [in 1942] he had a chance to lead a project that would not only demonstrate the superiority of American physics, but would also, in so doing, equip the US with a weapon that would enable it to win the war against Germany.[25]

Other features were Oppenheimer's brilliance and quickness of mind combined with his multifaceted, polymath personality.

The result was an eloquent, charismatic teacher and leader remarkable as a synthesizer and summarizer. According to physicist Robert Serber, who was a younger colleague of Oppenheimer's,

> Many facets of Oppenheimer's character contributed to his greatness as a teacher: his great capacity as a physicist, his wide intellectual interests, his astonishing quickness of mind, his great gift of expression, his sensitive perception, his social presence, which made him the center of every gathering. His students emulated him as best they could. They copied his gestures, his mannerisms, his intonations. He truly influenced their lives.[26]

Biographer and sociologist Charles Thorpe analyses Oppenheimer as the charismatic leader at Los Alamos. Though his leadership was "a collective task and a collective accomplishment,"[27] Thorpe contends that

> Oppenheimer was celebrated at Los Alamos for his ability to see the big picture: to synthesize the entire body of science involved in the project and, from this overall perspective, to bring order and cohesion to decision making and discourse. Famously, he could sum up opposing views in such a way that the argument would appear resolved — his "magical trick that brought respect" even from those who were "his superiors in terms of their scientific record." Although not set apart by a Nobel Prize, he was seen to be able to "rise above" the scientific flock, due to this combination of moral and intellectual qualities. His authority derived from an ability to speak for and bring to bear a consensus that was seen to already exist in potential. His synthetic knowledge, together with his perceived moral qualities, allowed him to reconcile conflicting parties and made him the "natural" spokesman for an underlying, though not yet realized, consensus. It was this underlying collegial consensus, for which he was believed to speak, that was the root and source of his authority; hence the close association between Oppenheimer's leadership and organizational forms … that expressed that collegial order.[28]

Oppenheimer as a flawed individual is another prominent biographical theme. He was arrogant and sharp-tongued, and has been

taken as insecure and fragmented. In the words of physicist and biographer John Rigden, Oppenheimer lacked a "sense of self." Moreover, as highlighted by others, Monk maintains that

> Oppenheimer cannot be understood without taking into account the importance of his deeply felt desire to overcome the sense of being an outsider that he inherited from his German Jewish background and his desire to get inside the centre of American political and social life.[29]

Given these faults along with a titanic ambition and a certain level of naïveté, Oppenheimer was susceptible to being manipulated especially given certain vulnerabilities (e.g., the "Chevelier incident" and his communist affiliations). Certainly, Captain de Silva, who was in charge of security at Los Alamos, believed this. In a 1943 memo to his superior concerning Oppenheimer and possible involvement in Soviet espionage, de Silva concluded (as set forth by Monk) that

> "Oppenheimer is deeply concerned with gaining a worldwide reputation as a scientist, and a place in history" through his leadership of the Los Alamos laboratory. The army [de Silva] maintained, "is in the position of being able to allow him to do so or to destroy his name, reputation, and career, if it should choose to do so." [De Silva] ended up suggesting that, if "strongly presented to him", the fact that the army could destroy his reputation, "would possibly give him a different view of his position with respect to the Army, which has been, heretofore, one in which he has been dominant because of his supposed essentiality."[30]

Concerning Oppenheimer's scientific character, and as emphasized by the physicist Freeman Dyson in his review of Monk's biography, Oppenheimer has been viewed as lacking what Germans call *Sitzfleisch* (sitting flesh as on a chair) or perseverance in English.[31] Dyson knew Oppenheimer as a friend and colleague at the Institute for Advanced Study. Murray Gell-Mann, who won the Nobel Prize for Physics in 1969 and was at the Institute for Advanced Study in 1951, agrees with Dyson saying,

> As far as I know, he [Oppenheimer] never wrote a long paper or did a long calculation, anything of that kind. He didn't have patience for that; his own work consisted of little *apercus*, but quite brilliant ones. But he inspired other people to do things, and his influence was fantastic.[32]

To a degree, this explains why Oppenheimer, even given his brilliance, was never awarded the Nobel Prize, and what philosopher and historian Robert Crease has called "Oppenheimer's ambiguous scientific legacy."[33]

Another biographical theme for understanding Oppenheimer is his commitment to internationalism and in particular scientific internationalism. Central to this theme are his efforts for the international control of atomic energy together with the influence of Niels Bohr and the idea of an Open World. This theme plays a prominent role in the following chapters.

Furthermore, the controversies and political battles that Oppenheimer engaged in have been the subject of historical interpretation as well as biographical analysis. Of particular note are the hydrogen bomb controversy and the resulting decision for a crash program to develop the H-bomb or Super, a bomb 1000 times more powerful than the atomic bomb dropped on Hiroshima. The GAC, under Oppenheimer's chairmanship, opposed the crash program on moral as well as technical grounds saying in the majority annex to its report that the Super "might become a weapon of genocide." In the minority annex, Rabi and fellow physicist Enrico Fermi even referred to the Super as "necessarily an evil thing considered in any light."[c] Though their recommendation was

[c]This use of such strong moral condemnation to characterize the Super is found in the GAC Report concerning a crash program to develop the hydrogen bomb. In October 1949 the General Advisory Committee (GAC) of the Atomic Energy Commission, chaired by Oppenheimer, announced (not to the public since this report was top secret) its opposition to a crash program to develop the super bomb. For the GAC such a program could not be technically justified at that time, and morally such "a super bomb might become a weapon of genocide" and "is necessarily an evil thing considered in any light." Others saw the crash program as a necessary response to the Soviet atomic bomb test in August 1949 that ended the US atomic monopoly. In January 1950 Truman announced his decision to develop the

rejected, the GAC (with veterans of the Manhattan Project like Oppenheimer, Fermi, and Conant who had supported the military use of the atomic bomb during the war) "made it clear that nuclear weapons policies must no longer be decided in a moral vacuum."[34] According to biographers Kai Bird and Martin Sherwin,

> In retrospect — and even at the time — it was clear that the H-bomb decision was a turning point in the Cold War's spiraling arms race. Like Oppenheimer, Kennan was thoroughly "disgusted." I. I. Rabi was outraged. "I never forgave Truman," he said.[35]

However, no member of the GAC resigned in protest.

For any interpretative understanding of Oppenheimer, the 1954 security hearing looms large. For science historian and biographer David Cassidy, Oppenheimer could have

> successfully stood up to the bullies. He still possessed the national and international stature to brush off these trumped-up charges and to refuse to accept the terms of such a proceeding. … Public resignation in outrage at his treatment would have done more to defend science and his own reputation than his sinking to the level of his accusers in an inevitably degrading attempt to defend his personal views and private behavior.[36]

But Cassidy reminds his reader that this was "out of character" for Oppenheimer and "would have required him suddenly to assume a wholly different role as a moral protest leader." Moreover, he would voluntarily be

> giving up the power and prestige and participation in high councils that he had worked so hard to attain as the nation's ultimate insider

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hydrogen bomb. In direct opposition to the GAC, the "Second Atomic Revolution" had begun with the development of the Super — a bomb that would be 1000 times more powerful than the atomic bomb that had destroyed Hiroshima. Note the strong moral condemnation by the GAC is with respect to the super bomb not the atomic bomb. The GAC took the super bomb (based on nuclear fusion) to be in a totally different destructive category than the atomic bomb (based on nuclear fission). For excerpts and discussion of the GAC report, see McMillan, *Ruin of J. Robert Oppenheimer* (ref. 234), pp. 36–40.

> scientist, the valued and esteemed leader of the nation's established scientific elite. Even more than that, he had worked for years toward shaping the nation's science-policy system along rational, even moral lines, into a managerial system directed toward achieving a moderate policy encompassing arms control and restraints on the ever expanding application of science to military weaponry.[37]

In his letter of response to his accusers concerning the "alternative suggested [quiet resignation]," Oppenheimer wrote

> Under the circumstances this course of action would mean that I accept and concur in the view that I am not fit to serve this Government, that I have now served for some 12 years. This I cannot do. If I were thus unworthy I could hardly have served our country as I have tried … or have spoken, as on more than one occasion I have found myself speaking, in the name of our science and our country.[38]

Oppenheimer's choosing not to resign and to fight here points to many things from personal ambition to defending American science conjoined with an open and moderate policy with respect to nuclear weaponry.

Like Thorpe and others, Bird and Sherwin construe Oppenheimer's defeat as having historic connotations.

> For a few years after World War II, scientists had been regarded as a new class of intellectuals, members of a public-policy priesthood who might legitimately offer expertise not only as scientists but as public philosophers. With Oppenheimer's defrocking, scientists knew that in the future they could serve the state only as experts on narrow scientific issues. As the sociologist Daniel Bell later observed, Oppenheimer's ordeal signified that the postwar "messianic role of the scientists" was now at an end. Scientists working within the system could not dissent from government policy, as Oppenheimer had done by writing his 1953 *Foreign Affairs* essay [strongly recommending government "candor" with regard to nuclear weapons], and still expect to serve on government advisory boards. The trial thus represented a watershed in the relations of the scientist to the government. The narrowest vision of how American scientists should serve their country had triumphed.[39]

Moreover, they interpret that

> Oppenheimer's defeat was also a defeat for American liberalism. Liberals were not on trial during the Rosenberg atom spy case. … But like many Roosevelt New Dealers, Oppenheimer had once been a man of the broad Left, active in Popular Front causes, close to many communists and to the Party itself. Having evolved into a liberal disillusioned with the Soviet Union, he had used his iconic status to join the ranks of the liberal foreign policy establishment, counting as personal friends men like Gen. George C. Marshall, Dean Acheson and McGeorge Bundy. Liberals had then embraced Oppenheimer as one of their own. His humiliation thus implicated liberalism, and liberal politicians understood that the rules of the game had changed. Now, even if the issue was not espionage, even if one's loyalty was unquestioned, challenging the wisdom of America's reliance on a nuclear arsenal was dangerous. The Oppenheimer hearing thus represented a significant step in the narrowing of the public forum during the early Cold War.[40]

Ironically, as pointed out by Bird and Sherwin, the "publicity surrounding the trial and its verdict enhanced Oppenheimer's fame both in America and abroad." Not only was Oppenheimer the Father of the Atomic Bomb, but now he was also "a scientist martyred, like Galileo."[41]

In concluding this biographical sketch, Oppenheimer's association with the Congress for Cultural Freedom (CCF) is worth highlighting. In November 1954, six months after his security hearing and political exile, it was officially announced that Oppenheimer was elected to the American Committee for Cultural Freedom which was affiliated with the CCF. Oppenheimer would become a significant figure in the CCF, and participate in a number of its events. Founded in 1950, the CCF was an international organization of artists, writers, and intellectuals that actively opposed "Communism and all other forms of totalitarianism" in the so-called war of ideas. With affiliates in Europe, North America, South America, and Asia, the CFF sponsored journals, newsletters, conferences, and seminars.

Today, many historians give prominence to the view that the Cold War was an "Ideological Project" (a war of ideas). Remarkably, the CFF is symbolic of this interpretation. Amid disclosures of its CIA funding, the CCF was dissolved in 1967.[42] Among its hundreds of members, there were numerous Americans — George Kennan (diplomat), Reinhold Niebuhr (public theologian), John Steinbeck (novelist), Sidney Hook (philosopher), Arthur Schlesinger Jr. (historian), Diana and Lionel Trilling (literary critics), Irving Kristol (journalist and future founder of neoconservatism), Norman Cousins (journalist and world peace advocate), and, of course, J. Robert Oppenheimer.

Recent Scholarship and the "Oppenheimer Challenge"

The centennial of Oppenheimer's birth was in 2004 and was reflected in the publication of at least eight biographical books on Oppenheimer during the years 2004 to 2008. Of particular note is *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer* by Kai Bird and Martin Sherwin, which won the 2006 Pulitzer Prize in biography. In addition, a collection of essays based on presentations at the 2004 Oppenheimer Centennial held at the University of California–Berkeley was published as well as some scholarly articles on Oppenheimer and substantial reviews of the above books.[43] In 2012, the interest in Oppenheimer reached new heights with the publication of an eight-hundred-page biography entitled *Inside the Centre: The Life of J. Robert Oppenheimer* by Ray Monk.

However, Oppenheimer as a subject presents us with major challenges. As illustrated in the biographical sketch, he was many things — scientist, weaponeer, government adviser, public intellectual, and icon for his age. Moreover, Oppenheimer was strategically placed and became the focus of historic forces and controversies that shaped the Twentieth Century. Consequently, as noted by historian Barton Bernstein, "Oppenheimer is not the kind of subject … for whom there will ever be a 'definitive' biography — too much of his life will remain subject to interpretive dispute."[44]

To illustrate differences in interpretation by Oppenheimer biographers, Charles Thorpe in his book, *Oppenheimer: The Tragic Intellect*

(2006), which he characterizes as a "sociological biography," contrasts his position with that of Bird and Sherwin and of Priscilla McMillan in her *The Ruin of J. Robert Oppenheimer* (2005). According to Thorpe, Bird and Sherwin take Oppenheimer as "an authentic voice of American scientific, intellectual, and political liberalism" and McMillan takes him as "a defeated moderating voice in American foreign policy." In contrast, Thorpe takes Oppenheimer as having failed "to develop a critical political perspective as his liberalism was shaped by the culture of the Cold War" and "in significant ways accommodated himself to and internalized the culture and mentality of the national-security state."[45]

Moreover, interpretations of Oppenheimer's philosophical outlook differ. Silvan Schweber, in his book *Einstein and Oppenheimer: The Meaning of Genius* (2008), emphasizes the influence of the Ethical Culture movement on Oppenheimer during his early years and places Oppenheimer, in part on the basis of his 1957 William James Lectures at Harvard and interactions with such philosophers as Morton White, in the tradition of American pragmatism. In contrast, using themes from the sociologist Max Weber (1864–1920), Thorpe emphasizes the role of such things as vocational ethics in Oppenheimer's thought.

On a more personal level, Oppenheimer presents a challenge. As Oppenheimer's close friend Rabi once remarked "God knows I'm not the simplest person, but compared to Oppenheimer, I'm very, very simple."[46] Oppenheimer has been taken as "elusive," "enigmatic," and "fragmented." For some, Oppenheimer was "a person who, throughout his entire life, tried on different masks … without ever establishing a coherent identity or gaining a sense of who he was."[47] Oppenheimer could also promote "a love-hate relation." Abraham Pais, a close colleague of Oppenheimer's at the Institute for Advanced Study, knew "of largely just love or hate responses among many who knew" Oppenheimer, analogous to "the ways people react to New York City."[48]

Finally, Oppenheimer's thought and philosophical outlook present another challenge. For one, Oppenheimer like many other intellectuals never wrote a book that is a systematic exposition of his views. For example, his book *Science and the Common Understanding* is his

BBC Reith Lectures given in 1953, and his book *The Open Mind* is a collection of eight lectures delivered between 1946 and 1954. Additionally, the majority of sources for Oppenheimer's thought consists of lectures and talks, both published and unpublished. Since they were tailored for different live audiences, these works are repetitive, make little or no reference to previous works, and in many cases lack detail and depth. Such an approach for presenting one's views was by no means unique to Oppenheimer and is found among other scientists and intellectuals; for example, Bohr and Rabi took this approach.[49]

Oppenheimer's lecturing style also presents challenges. He typically lectured using abbreviated notes; and his poetic, oracular style could leave audiences more mesmerized than informed. Interestingly, Thorpe notes that Oppenheimer attempted to tutor David Lilienthal, a friend and government official, in the art of such lecturing by praising one of Lilienthal's speeches as "very sound and deep and with just the right lightness of touch in pointing to the great human and ethical substrata that determine our way of life without handling them in such an explicit way that the touch destroys."[50]

In spite of this, the corpus of Oppenheimer's works is extensive and provides for a discussion and criticism of his views as well as considerations of influence and development over time. Furthermore, it not only contains individual lectures and talks, but also contains several lecture series which assist in adding detail and depth to his views. Three lecture series have been published, and at least four others have been transcribed.[51] Also, Oppenheimer did revise and edit to varying degrees the lectures and talks that he published as well as wrote articles directly for publication. In addition, Oppenheimer's interactions with other intellectuals — scholars, scientists, and artists — can be documented and assist in exploring and elaborating Oppenheimer's thought and philosophical outlook.[52] In particular, Oppenheimer's interactions with the Pulitzer Prize-winning poet Archibald MacLeish as well as his close friend and Nobel Prizing-winning physicist I. I. Rabi will be the subjects for Chapters 3 and 4, respectively.

To conclude this chapter, let us return to biographical themes that assist in interpreting and understanding Oppenheimer. As explored and highlighted earlier, there are Oppenheimer's dedication and

commitment to science, especially physics; his love of and loyalty to America; and his commitment to internationalism. There is also the theme of his brilliance and polymath characteristics in conjunction with a fragmented personality and significant human failings.

There are other biographical themes as well, and certainly one of them is centered on responsibility. In his 1954 security hearing, Oppenheimer was questioned why he felt it was his "function as a scientist to express views on military strategy and tactics." Oppenheimer replied "I felt, perhaps quite strongly, that having played an active part in promoting a revolution in warfare, I needed to be as responsible as I could with regard to what came of this revolution."[53] Even though responsibility for the atomic revolution is in large measure a collective responsibility, Oppenheimer's taking responsibility at the individual level is fitting given the significant role he played in this revolution. Indeed, in some ways, it was necessitated. In addition to the part he played, Oppenheimer had knowledge and abilities along with political and symbolic capital to step forward and take responsibility and help shape "what came of this revolution." This responsibility clearly exhibited at least two dimensions. The principal dimension was to help shape government policy, both domestic and foreign, with regard to nuclear weapons and energy. This is illustrated by his leading role in the 1946 Acheson–Lilienthal proposal for the international control of atomic energy, his chairmanship of the General Advisory Committee to the AEC and its 1949 opposition to the H-bomb, his recommendations for flexible response and civil defense in nuclear strategy, and his refusal to resign and hence confront oppositional forces in his 1954 security hearing.

Another dimension of his individual responsibility was to assist and facilitate the general public as well as elites in confronting and understanding the atomic revolution. This dimension is certainly illustrated by his public presentations — in number, subject matter, and audience. In addition, given the urgency and public nature of this responsibility, it is understandable, in part, why he might not attempt a scholarly, systematic exposition of his views and even recommend the need for a certain "lightness of touch."

In December 1966, less than two months before Oppenheimer died, Thomas Morgan of *Look Magazine* published a conversational piece entitled "With Oppenheimer." In this conversation, surely sensing his own mortality and legacy, Oppenheimer remarked

> The use of the word "responsibility" … is almost a secular device for using a religious notion without attaching it to a transcendent being. … Now, I don't know how to describe my life without using some word like "responsibility" to characterize it, a word that has to do with choice and action and the tension in which choices can be resolved.[54]