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The Agony of Atomic Genius

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More than sixty years along, the development of nuclear weaponry remains the supreme technological innovation of our time, and the atomic physics on which it is based is perhaps the most wondrous intellectual achievement since Socrates taught his admirers that death holds no terrors for a good man. Of course, few men have ever been good enough to be entirely free of such terrors; and the unprecedented scientific advances of the past century have added the terror of thermonuclear megadeath and possible human extinction to the things that saddle all but the very best men with mortal angst.

J. Robert Oppenheimer and the American Century
By David C. Cassidy
Pi Press ~ 2005 ~ 462 pp.
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American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer
By Kai Bird and Martin J. Sherwin
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The Ruin of J. Robert Oppenheimer and the Birth of the Modern Arms Race
By Priscilla J. McMillan
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These novel terrors have been intense and persistent enough in the popular mind that atomic science is widely regarded as the principal scourge of humanity; and the Manhattan Project physicists whose skill as bombmakers earned them the admiring gratitude of free peoples in 1945 are reviled as the evil geniuses who made life more perilous than it ever was before. They shouldn't have done it, the sentiment runs; they were scientists, after all, and they should have known better than to lend their intelligence to so terrible an undertaking. But can scientists really be expected to know better—indeed, to know best? Does their understanding of the workings of nature endow them with a sounder moral understanding than the common run of humanity? Ought the immemorial guiding virtue of the political man, prudence, direct or instead be directed by the scientific intellect? By descending into the political inferno, were the scientists complicit in profound evil?

The career of J. Robert Oppenheimer, the physicist who headed the Manhattan Project, draws such questions to a focus that resembles the bead of a laser-gunsight on a victim's

breastbone. It was Oppenheimer whom the public lionized as the brains behind the bomb; who agonized about the devastation his brilliance had helped to unleash; who hoped that the very destructiveness of the new "gadget," as the bomb-makers called their invention, might make war obsolete; and whose sometime Communist fellow-traveling and opposition to the development of the hydrogen bomb—a weapon a thousand times more powerful than the bombs that incinerated Hiroshima and Nagasaki—brought about his political disgrace and downfall, which of course have marked him in the eyes of some as all the more heroic, a visionary persecuted by warmongering McCarthyite troglodytes. His legacy, of course, is far more complicated.

Julius Robert Oppenheimer was born in Manhattan in 1904. His father, Julius, was a German Jewish immigrant who made a fortune in clothing manufacture, and young Robert grew up a child of privilege, fussed over by a live-in governess and maid in a high-rise apartment on Riverside Drive. A dorky brainiac, virtually friendless, the poor kid was something of a Little Lord Fauntleroy in the bargain. At school a teacher complained that Robert took the elevator to the second floor, and asked his parents to teach him how to walk up and down stairs. The child made his own world, as loners do, reading poetry, collecting minerals; although inept at most sports, he became a crackerjack sailor and horseman, and was known for getting along better with horses than with human beings.

For ten years he attended the Ethical Culture School, which epitomized Jewish high bourgeois secular liberalism, concerned with the plight of the poor, guided by ideals of social justice, relentlessly hopeful, earnest, and progressive; Ethical Culture Society members promoted women's suffrage and the prohibition of alcohol, and took part in the founding of the ACLU and the NAACP. To transform society was the express aim of Ethical Culture, and to produce an intellectual and moral elite devoted to service was the School's appointed task. In this heroic order, intellectual excellence pointedly ranked just as high as moral virtue; and for an aspiring polymath like young Oppenheimer, the highest life of the mind was indispensable to the life of moral striving.

Oppenheimer entered Harvard intending to study chemistry and emerged three years later an experimental physicist on his way to becoming a theoretical physicist. That he happened to be a wizard at abstract speculation, had a "passion for the purely useless," and was something of a dolt at what scientists call the bench—soldering copper wires gave him fits—made his ultimate career choice an easy one. But his overarch-

ing purpose, he announced, was to confront and master "the serious business of life, which is growing wise." To that end he read French poetry, which may have been a dubious course to wisdom, and wrote English verse and stories, perhaps a more innocent activity. In *J. Robert Oppenheimer and the American Century*, his biographer David C. Cassidy, a historian and philosopher of science, chastises Oppenheimer for lacking the professional single-mindedness essential to a scientific career at the highest level, and faults him for having too many talents, none of which he concentrated on sufficiently. Oppenheimer's champagne mind sparkled, fizzed, and sprayed in all directions, yet he still managed to become a superb theoretician, teacher, and administrator. He continued his formal training at Cambridge University, where he studied with Ernest Rutherford and met Niels Bohr, founding father of quantum physics; then he completed his Ph.D. at Göttingen, where he worked under Max Born and met Werner Heisenberg, who would lead the German effort to develop an atomic bomb; and he did postdoctoral training with Wolfgang Pauli in Zurich.

Born recalled Oppenheimer as a shining intelligence but a brash upstart, who would break in snidely on seminar presentations to explain matters more lucidly than the distinguished speakers could. Already he was cultivating his high-handed flair for the devastating remark, as though discussing the mysteries of the universe were a competitive sport. The purest, most disinterested life, untrammeled by egotism, is supposed to be that of thought about the highest things, according to the thinkers who have pursued such activity. Oppenheimer's vanity or *amour-propre*, which impelled him to measure himself incessantly against his colleagues, whom he treated as rivals, muddied this theoretical purity even more than it does for most scientists.

Oppenheimer turned out a dozen research papers before he was twenty-five, mostly training the searchlight of the latest quantum theory on certain experimental observations old and new: important work, Cassidy avers, but derivative, well short of the theoretical cutting edge, where the finest minds—Heisenberg, Bohr, Born, Pauli, Paul Dirac—were laying bare the secrets of the subatomic world and transforming the understanding of matter and energy. The "quantum revolution," in Cassidy's phrase, began to take the staid precincts of academic physics by storm, and by the late 1920s its leaders occupied some of the most prestigious chairs in European universities.

America saw the future of physics in Europe, sent over young theoreticians by the boatload to sit at the feet of the masters, and coaxed some of the masters across the Atlantic to teach. Oppenheimer, a fledgling

instructor at Berkeley in 1929, soon established himself as a professorial master. Hans Bethe was to declare that far and away "the greatest school of theoretical physics that the United States has ever known" was the one Oppenheimer headed at Berkeley and Caltech during the 1930s and early 1940s. Oppenheimer's style of intelligence was perfectly suited to the seminar room: he possessed a mind quick as a striking cobra, capable of penetrating to the essentials of a new discovery while lesser men were fogged in by the details, recognizing straightaway the practical implications of abstruse theorizing, so thoroughly versed in the various relevant fields that concision and exactitude in explanation came naturally as breathing, and graced with a charm that captivated serious persons and drew the best out of them. Among topflight scientists, of course, prodigious feats of calculation or insight are as commonplace as a 90-mile-per-hour fastball in the major leagues; when everyone is a genius, the highest distinction is hard to come by. Although Oppenheimer's mind was not the whiz-bang computer of a John von Neumann or the astral navigation system of a Hans Bethe, it processed other men's original contributions so adeptly that for multifaceted excellence it may well have been the finest scientific instrument of all.

Indeed, Cassidy argues cogently that one of the most impressive facets of Oppenheimer's achievement has been largely ignored. Although Oppenheimer's accepting the directorship of the A-bomb project despite lacking a Nobel Prize caused something of a scandal among topflight physicists, Cassidy claims that Oppenheimer had already conducted work worthy of the highest scientific honor: his "application of nuclear physics and of general relativity theory at the end of a star's life cycle" anticipated by nearly thirty years the astronomical observations of the collapsed stars known as black holes. Oppenheimer's theorizing was so startlingly original—so far in advance of the corroborating observations and so far off the beaten track of astrophysical research—that his colleagues' ignorance cost him the recognition he deserved.

Oppenheimer's continuing quest for wisdom led him far beyond the confines of modern science. He studied Sanskrit, a notoriously difficult language to acquire, and was soon reading the classic Indian religious literature, in search of knowledge that physics couldn't provide him. Some colleagues saw this breadth of intellectual passion as dabbling in alien mysticism and a diversion from serious work. I. I. Rabi declared that a lot more analytical rigor and a lot less spiritual fuzziness would have been required to make Oppenheimer a scientific original: "[I]n some respects Oppenheimer was overeducated in those fields that lie outside

the scientific tradition, such as his interest in religion, in the Hindu religion in particular, which resulted in a feeling for the mystery of the universe that surrounded him almost like a fog. He saw physics clearly, looking toward what had already been done, but at the border he tended to feel that there was much more of the mysterious and novel than there actually was."

Drawn to the recondite and inexplicable in metaphysics, Oppenheimer sought firm conviction in politics, where ideology often passes for certainty; and like so many intellectuals in the 1930s, he fell for the utopian confidence game of Communism. It took some doing to get him even to notice the political world in the first place: the depth of the Great Depression did not register with him until his students found themselves jobless. A romance with the bitterly melancholic Jean Tatlock, who had an on-again off-again affair with the Communist Party, pulled him into sinister political company. His motives were noble in part, however misguided: like many fellow travelers, he saw Soviet Communism as the only curative for Fascism. The plight of the Jews in Nazi Germany—and indeed of science itself, for quantum mechanics and relativity theory were proscribed there as "Jewish physics"—moved him to what he called "a continuing, smoldering fury" and prompted him to give three percent of his salary to displaced scientists. With his customary whirlwind energy, he supported nearly every Communist-front organization in the Bay Area, backing striking longshoremen, organizing a teachers' union, joining several committees for the Spanish Republican cause, helping out migrant farm workers, and taking part in gatherings of parlor-pink academics and more dedicated subversives. The woman he married, Katherine Puening Harrison, was the widow of a Communist labor organizer who had died in the Spanish Civil War, and she herself had been a Party member for several years. Oppenheimer's brother, Frank, also a physicist, and Frank's wife were members, too.

Oppenheimer always denied ever having been a Communist Party member—though as Cassidy points out, had he been a member, the Party would have kept his membership secret. The former Soviet spymaster Pavel Sudoplatov declared in 1994 that Oppenheimer had been a clandestine Party member—the equivalent of a Roman Catholic cardinal *in cuore*, who is living under a tyranny and whose identity only the Pope knows—and that, colluding with Enrico Fermi and Leo Szilard, he had helped spies infiltrate the Manhattan Project and deliver secret documents to their Soviet overseers. The Soviet cables intercepted by American counterintelligence and known as the Venona files have yielded no evidence

to suggest Oppenheimer was a Party member or to implicate him or the other accused eminent physicists in any such espionage scheme. Sifting through these and other conflicting reports, Cassidy, like Oppenheimer's other biographers, clears him of the damning allegations.

Yet his undeniable fellow-traveling made him suspect enough, particularly in the eyes of military intelligence; when his name was proposed for the scientific leadership of the A-bomb enterprise, various authorities pronounced him profoundly unsuitable. But Oppenheimer had the champion he needed in General Leslie Groves. Despite his preference for combat duty, Groves was assigned to command the Manhattan Project—his work heading up the construction of the Pentagon made him the ideal candidate—and he insisted, above numerous high-placed objections, that Oppenheimer be in charge of the physicist legions. The urgency of the task—what if the Nazis or the Japanese should produce such a weapon first?—overrode any reservations about Oppenheimer's loyalty.

At first, Oppenheimer was anything but eager to devote himself to the war effort, which he regarded as snatching the best minds away from their true vocation. However, Cassidy writes, an investigation into possible subversives that the California state assembly proposed early in 1941 made Oppenheimer fear for his teaching position, and in a letter to a friend already engaged in war research he announced that, to prove his loyalty, he too would serve his country: "I have a lot more misgivings even than you ever had about what will come of all this; but even so I think surely if I were asked to do a job I could do really well and that needed doing I'd not refuse. I'd worry a lot, perhaps even more than you. But we worry anyway."

Such anxiety was unavoidable: In Oppenheimer's Ethical Culture upbringing, and indeed in the culture at large, scientists were revered as white knights consecrated to the cosmopolitan ideals of perpetual peace, rapturous discovery in the name of humankind, and the fulfillment of Francis Bacon's project for "the relief of man's estate." The distressing human predilection for the occasional blood-feast did, of course, impede man's progress toward these ever-appealing ends. Alfred Nobel had hoped that his invention of dynamite, which enhanced exponentially the possibilities for battle carnage, would put people off war forever; it didn't happen. Albert Einstein, equally peaceable but more discerning, said of the weaponry developed before the First World War—machine guns, massive artillery—that entrusting human beings with modern technology was like putting a meat ax in the hands of a psychopath. The flower of Wilhelmine chemistry devoted itself to devising chemical weapons that would eviscerate the throats

and lungs of the French and British enemy in the Great War. When Fritz Haber, the presiding genius of German chemical weaponry, was implored by his wife, herself a chemistry Ph.D., to give up his work on poison gas, he replied that in peace a scientist serves mankind but in war he serves his country. His wife killed herself that night.

The atomic bomb would loose upon the world blast and heat and radiation of a magnitude dwarfing all previous agents of devastation. To activate this fearsome power latent in the atom required the labors of generations of scientists, most of whom never imagined their purely theoretical discoveries would be put to such use. The scientific succession reads like a Biblical genealogy, as Isaac Newton begat James Clerk Maxwell who begat Max Planck who begat Ernest Rutherford and so on to Stanislaw Ulam and Edward Teller, who begat the hydrogen bomb. Some of these researchers and thinkers were innocent as could be; in praise of Rutherford, who observed spontaneous radioactive decay in certain elements and thereby discovered the fundamental structure of the atom, his protégé James Chadwick honored "his genius to be astonished." Wonder, sheer delighted amazement at nature's paradoxical prodigality and order, was the prime mover for the best of these men, and probably animated all of them to some great degree. For some pure souls, working for the military corrupted that delight. As I. I. Rabi said in declining Oppenheimer's offer to be associate director of the Manhattan Project at Los Alamos, New Mexico, he didn't care to think that "the culmination of three centuries of physics" would be the biggest man-made explosion ever.

Oppenheimer for his part thought less of the previous 300 years than of immediate military necessities: "To me [the task at hand] is primarily the development in time of war of a military weapon of some consequence." The devotion to his nation's cause was real; so was the thought that making the weapon to save civilization would win him a handsome measure of honor and renown, equal perhaps to that enjoyed by great statesmen and generals, leaving a name down the centuries more lasting than even those of Roosevelt and Churchill. Kai Bird and Martin J. Sherwin paint a vivid portrait of Oppenheimer's ambition in *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer*. In 1943, as the book reports, General Groves told a project security officer who wanted to deny Oppenheimer his security clearance that the physicist's craving to make his world-historical name was so intense that it assured his loyalty. Already evident in youth, the longing to stand head and shoulders above the rest of humanity showed all the more obviously as the

stakes, and the prizes, reached heroic proportions. The intellectual world abounds with gloryhounds, yet everyone who aspires to seriousness recognizes that the finest scholars and scientists, to a great degree, work for the sheer pleasure of knowing and not for the glint of envy in other men's eyes. Oppenheimer was not graced with this pure-mindedness; the forces driving him were tangled and complex, or compound-complex, like an especially nasty fracture: protecting free men from the most formidable alliance of tyrants ever, winning all due recognition for his part in the success, overcoming the most refractory theoretical and practical difficulties that scientists had ever faced, commanding the greatest assembly of intellectual talent ever devoted to a single consuming public task, and proving himself in the most dramatic fashion a lord and master of nature itself. A man of such parts, had he been able to integrate the various impulses, might have been superbly whole; but Oppenheimer was anything but whole. Historians often speak of T. E. Lawrence as the most complicated soul in modern military annals; but when all the fissures, fault-lines, and contradictions are added up, Oppenheimer deserves this distinction as well.

The divisions in Oppenheimer's nature widened as the project proceeded from developing the bomb to dropping it, from the creation of a nuclear weapon to the ravaging of entire cities. While waiting for the first atomic test at Alamogordo, ever the aesthete, he sat reading Baudelaire. Addressing a meeting convened by the Secretary of War in May 1945 to decide on the use of the bombs, he enthused as over a Turner skyscape, "the visual effect of an atomic bombing would be tremendous. It would be accompanied by a brilliant luminescence which would rise to a height of 10,000 to 20,000 feet." Only after admiring the atomic light show did Oppenheimer mention the lethal range of the explosion: any human being within two-thirds of a mile of Ground Zero was likely to die. Sometimes aesthetic appreciation can overcome moral considerations in the most disturbing way.

Such peculiar detachment stemmed from Oppenheimer's conviction, at least at first, that simply to produce the weapon was his exclusive concern. How the bomb was to be used remained the prerogative of statesmen and military brass. Cassidy sees this feeling of reduced moral responsibility as largely a product of the prevailing culture rather than of Oppenheimer's distinctive sensibility: "Under Vannevar Bush [the M.I.T. engineer who sold the Manhattan Project to President Roosevelt], the scientist as the enlightened keeper of cultural ideals and an equal partner with military and political leaders was replaced by a new conception of the scientist as a mere technician of physical processes, an employee

working under orders at the bottom of a bureaucratic hierarchy." When Project physicists began to voice misgivings about the morality of their handiwork, to the point of wondering whether they could decently continue working at Los Alamos, Oppenheimer did his best to curb their doubts. Speaking to groups of the querulous and disenchanted, with gentle eloquence he admitted that atomic bombs would make fear a permanent feature of ordinary life, but then proclaimed that they might nevertheless mean an end to war. Oppenheimer had already joined Niels Bohr in foretelling that national governments would yield a significant portion of their sovereignty to the United Nations, which would guarantee the peace of the world. Oppenheimer's assumption of moral leadership over his team convinced the scientists it was not up to them to settle political and military questions, and further assured them that the men qualified to settle such matters would come up with the right answers.

The actual sight of the Trinity test explosion, however, prompted the beginnings of a change of heart, although that change was not apparent to everyone at first. I. I. Rabi remarked that after the successful test, Oppenheimer strode proudly as an Aristotelian great-souled man, who knows himself every other man's superior, with some hip-swinging virile Hollywood flash besides: "I'll never forget his walk; I'll never forget the way he stepped out of the car.... [H]is walk was like *High Noon*... this kind of strut. He had done it." Yet doubts about what he had just done bored into his moral confidence, probing ever deeper over time. Years later he would remember thinking to himself as he saw the towering cloud of the blast, "Now I am become death, the destroyer of worlds"—a quotation from his beloved *Bhagavad Gita*, in which the god Vishnu exhorts Prince Arjuna to do his duty and pursue martial greatness. This quotation would be enshrined as Oppenheimer's signature line, and as the expression of inconsolable regret. However, the ambiguity of the line, which speaks of awful ruin, godly power, and endless glory in the same breath, suggests the depths of Oppenheimer's own moral confusion. He was beginning to tremble at the dark power he had helped create, but the morning of the test he could still tell the *New York Times*: "Lots of boys not grown up yet will owe their life to it."

Yet Oppenheimer was becoming all too aware of the suffering his prized invention was going to cause, and increasingly remorseful for being so complicit in so much death. An associate recalled running into Oppenheimer on his way to work, when the sorrowfully bemused chief repeated again and again of the Japanese victims: "Those poor little people, those poor little people."

Nevertheless, as Bird and Sherwin acidly observe, "That very week, however, Oppenheimer was working hard to make sure that the bomb exploded efficiently over those 'poor little people.'" Whether one considers this diligence of Oppenheimer's to be evidence of moral weakness or of admirable strength largely defines one's view of the moral responsibility of scientists and political men: can one somehow weigh the suffering in Hiroshima and Nagasaki against the suffering averted by ending the war without the need for a monumentally bloody invasion of Japan? Oppenheimer seemed unable to make up his mind—proud yet guilty, relieved that many American soldiers would be spared yet haunted by the mass death inflicted on America's enemies.

Oppenheimer's growing guilt did not always stand in the way of the thrill of his scientific achievement. The evening of August 6, 1945, after the uranium bomb razed Hiroshima, before a packed and cheering auditorium at Los Alamos, Oppenheimer displayed all the chesty self-satisfaction of the conquering hero, playing to the crowd, indulging in the prizefighter's traditional pose of triumphant manliness, clasping his hands over his head and waving them in the air. When Oppenheimer declared that his only regret was not making the bomb in time to use it against the Germans, the crowd went wild, as for a blast into the upper deck by Joe DiMaggio or Ted Williams. But the war fever soon cooled. As *Life* magazine proclaimed the Los Alamos physicists superheroes of scientific intelligence, Oppenheimer was lamenting the subservience of science to innate human cruelty in an address to the American Philosophical Society: "We have made a thing, a most terrible weapon, that has altered abruptly and profoundly the nature of the world…a thing that by all the standards of the world we grew up in is an evil thing. And by so doing…we have raised again the question of whether science is good for man." This public admission of personal despair at the moral collapse of the modern world's leading intellectual enterprise could not be more nakedly penitent. The heartbreak of everlasting loss is unmistakable here: with the creation of the atomic bomb, the world will never again be what it once was. Modern science had permanently altered the nature of moral and political life.

Yet this transformation at the hands of scientific genius had come about without transforming human nature accordingly. And it was only his belief that human nature could indeed change, decisively and permanently, that colored Oppenheimer's penitence with the hope of salvation. The time-honored life of men in nations, their tribal furies in perpetual collision, would now necessarily give way to a mode of harmonious existence imagined

often enough but never seriously attempted before: the peoples of the world must and shall be one, or else they shall inevitably destroy each other. A millenarian fire burned in Oppenheimer's spirit, fueled by his pride as a world-historical individual, by his fear that the natural force he loosed upon the world would escape all human control, and by a pure-hearted longing to ensure that his discovery of the devastation latent in the elemental substance of the world would serve concord rather than the ultimate discord, perpetual peace rather than permanent self-destruction. For the first time in history, technological advance had made the utopian fantasy of a unified world a prerequisite to mankind's very survival. "The peoples of this world must unite or they will perish. This war, that has ravaged so much of the earth, has written these words. The atomic bomb has spelled them out for all men to understand."

Oppenheimer's struggle with despair never quite ended. His savage self-loathing reached its nadir when he met with President Truman and announced, "Mr. President, I feel I have blood on my hands." Truman despised Oppenheimer's theatrics on this occasion more than Oppenheimer despised himself. According to legend, Truman took out his handkerchief and presented it to the blood-soaked scientist, saying, "Well, here, would you like to wipe your hands?" After the encounter, Truman observed, "Blood on his hands, damn it, he hasn't half as much blood on his hands as I have. You just don't go around bellyaching about it." Denouncing Oppenheimer as "a cry-baby scientist," Truman, in a display of true manliness, insisted that nuclear war be conducted without tears.

The difficult debate over the morality of Hiroshima and Nagasaki, captured so vividly in the clash between the remorseful scientist and the hard-headed statesman, persists intensely to this day. The Japanese novelist Kenzaburo Oe, a Nobel laureate for literature, writes in his 1965 nonfiction work *Hiroshima Notes*, "From the instant the atomic bomb exploded, it became the symbol of all human evil; it was a savagely primitive demon and a most modern curse." In Oe's appraisal, Hiroshima outdoes even Auschwitz for evil. Yet his contention sounds parochial and even partisan when one considers the deliberate wickedness of Japanese wartime science, as numbered by Gavan Daws in *Prisoners of the Japanese*. Unit 731 in Manchuria subjected POWs and Asian civilians to so-called medical experiments after the Mengele fashion, in which the subjects were "burned with flame-throwers, blown up with shrapnel and left to develop gas gangrene, bombarded with lethal doses of X-rays, whirled to death in giant centrifuges, subjected to high pressure in sealed chambers until their eyes popped from their sock-

ets, electrocuted, dehydrated, frozen, boiled alive." One can debate whether using nuclear weapons is ever morally justifiable, given the unavoidability of mass civilian casualties; and one can argue whether America's use of these weapons served a legitimate war aim. About Japanese wartime science, however, there is no such debate. Such experiments were diabolical by design; they had nothing to do with winning the war but seemed inspired by sadism mingled with inhuman scientific curiosity. Those who started the war were farther gone in evil than those who finished it with atomic weapons.

Yet the question whether Hiroshima and Nagasaki were necessary to finish the war remains alive sixty years on. In June 1946, Oppenheimer stated that the A-bombs had been dropped on a defeated enemy. More recently, intellectuals of the Left, including provocateur Gore Vidal and Oppenheimer biographer Kai Bird, have argued that Japan was on the verge of surrender before the bombings, meaning that the 200,000 Japanese casualties were not militarily necessary. They cite Japanese diplomatic cables to President Truman stating that, although the unconditional surrender the Allies demanded was unacceptable, the only condition Japan required was that the Emperor be allowed to remain on the throne. Critics of this line of argument find the leftist outrage outrageous. As the historian Richard B. Frank recently argued in *The Weekly Standard*, Allied intercepts of secret Japanese diplomatic cables revealed that the compromise peace was a red herring, that Japan intended to resist to the cruel finish, and that the Japanese believed the flabby Allies, weak even in victory, could be convinced thereby to set more agreeable terms for surrender. Furthermore, the Japanese military insisted not merely that the Emperor remain as figurehead but that the native military ethos and apparatus be preserved: the intention was to make peace only to prepare for later war. Hiroshima, then, spared an estimated million lives, which would have been lost in a full-out invasion of the home islands. The matter of Nagasaki is more problematic, however. Oppenheimer would state in 1953 that he "didn't understand to this day why Nagasaki was necessary." Some of those who now believe it to have been necessary argue that the Japanese military had its fanatics who were unconvinced even by Hiroshima that it was time to give up; others suspect that the Nagasaki bombing may have been conducted principally to get the Soviets' attention, a first strike in the long Cold War to come.

With the end of the Second World War, the Soviet Union was now high on the list of tyrannical enemies of democracy, and American nuclear weapons development and strategic theory were

fashioned with that enemy foremost in mind. Oppenheimer's sympathy for Communism, his enthusiasm for world government as the ultimate arbiter of nuclear technology, and his qualms about the proposed second generation of nuclear weapons, played a critical role in the history of the Cold War and in the precipitous course of his subsequent career. Already, in the fall of 1945, when Edward Teller was pressing for immediate development of the hydrogen bomb (the "Super," as it was called), Oppenheimer responded coldly and tersely: "I neither can nor will do so." Oppenheimer regarded the Super as a genocidal weapon: its only conceivable purpose would be the destruction of civilian populations by the millions—and ideally in the tens or hundreds of millions. The sole end of war with H-bombs would be annihilation. The peace that such a war would bring would be that of the mass grave; and if there were any survivors, they would likely prefer to have been among the dead. Civilization would have to be reconstituted from radioactive ash.

And yet the undeniable perfidy of the Stalinist Soviet Union convinced even Oppenheimer that the Atomic Energy Commission (AEC), created to oversee the use of atoms for peace, would be above all the instrument of war. In 1947, Oppenheimer declared that the agency's main job was to "provide atomic weapons and good atomic weapons and many atomic weapons." And Oppenheimer wanted to be the moving force in this work, despite his ever-deepening moral qualms.

But Oppenheimer was never of one mind for long. The Soviets' test of an atomic bomb in 1949 propelled him back to the internationalist position he had taken just after the war, believing that a single world organization should govern the nuclear policies of every individual nation. While Edward Teller insisted that the Super was needed now more than ever, Oppenheimer huffed, "Keep your shirt on." He joined Enrico Fermi and other eminent physicists in lobbying Roosevelt's former vice-president Henry Wallace to stop H-bomb development, "primarily because we should prefer defeat in war to victory obtained at the expense of the enormous human disaster that would be caused by its determined use." To possess a weapon of incalculable potency—some theoreticians feared it could ignite the atmosphere in an explosive chain reaction and destroy the earth—would pose graver dangers than not to have one at all.

AEC commissioner Lewis Strauss did not agree, joining Teller as the loudest voice in favor of a "quantum jump" in the lethal capacity of our nuclear stockpile. They wanted H-bombs as fast as they could be built. For a time, Oppenheimer's counsel prevailed in the AEC; in November 1949 the Commission narrowly voted not to go after the Super. In short

order, however, President Truman overrode the Commission's decision, and the Super project was underway.

On February 1, 1950, the day after Truman had inaugurated development of the Super, J. Edgar Hoover informed Strauss that a Soviet spy had infiltrated the Manhattan Project during the war: Klaus Fuchs, a German refugee from Nazism. Strauss blamed Oppenheimer for this terrible lapse in security, and went after him with everything he had. Oppenheimer made other powerful enemies as well, notably the anti-Communist Congressman Henry "Scoop" Jackson and the Strategic Air Command. While Oppenheimer was making the case for tactical nuclear weapons, useful on the battlefield, the Strategic Air Command's war plan emphasized a massive and decisive nuclear first strike in the event of a conventional Soviet attack on Western Europe. According to Bird and Sherwin, the H-bomb advocates were so obsessed with the threat of Communism that they believed "Oppenheimer's championing of tactical nuclear weapons was a ploy to block the Super Bomb." Teller went so far as to spread the word that in trying to block the H-bomb Oppenheimer was acting on "direct orders from Moscow." Teller may have been out of control, the Strategic Air Command may have been defending its turf, and Strauss may have been seeking personal revenge against Oppenheimer, but all the same, the gravest matters were at stake. The Soviet Union was a real threat that needed to be confronted with sobriety; seeing the defenders of the H-bomb as fanatics and conspiracy theorists foolishly belittles the existential challenge America was then just beginning to face.

These ideological battles eventually, and perhaps inevitably, became even more personal. By 1953, Oppenheimer had discovered that the Strategic Air Command's battle plan called for the defense of its own attack force but did nothing to protect the nation itself from attack: that job would have distracted from the self-appointed task of retaliating in turn for the Soviet retaliation for an American first strike. This military secret, Oppenheimer believed, had to be made public, yet such publicity was anathema to Strauss and his band. President Eisenhower seemed receptive at first to the Oppenheimer line, but Strauss saw to it that the President wound up mistrusting the physicist. In due course, Eisenhower authorized an AEC investigation into Oppenheimer's loyalty, and ordered the attorney general to erect "a blank wall" to keep Oppenheimer away from classified material. In November 1953, Oppenheimer was presented with a formal list of the charges against him and informed that his security clearance was suspended. As summarized by Bird and Sherwin, the charges included his membership

in various Communist front organizations; his affair with one known Communist, Jean Tatlock, his friendships with others, and his employing still others in the Manhattan Project; his making a significant monthly donation to the Communist Party in San Francisco; and his delay and dishonesty in notifying the authorities of an attempt in 1943 by a friend, a Berkeley professor of French literature, Haakon Chevalier, to enlist him in delivering secret information to Soviet spies under diplomatic cover in San Francisco. Furthermore, it was alleged that Oppenheimer's opposition to the H-bomb project persuaded other scientists that the Super ought to have been aborted at conception, setting back progress on that weapon by months or years while the parallel Soviet project blithely moved forward. In his fear and despair, Oppenheimer resorted to alcohol and sleeping pills, collapsed unconscious on his bathroom floor one night, and had to be revived by his wife and friends.

Senator Joseph McCarthy claimed to have evidence of extensive sabotage of the H-bomb project, and implied that he had the goods on Oppenheimer. Fearing that McCarthy would steal his thunder, and supposedly acting in order to prevent Oppenheimer's defection to the Soviets before the scheduled AEC hearing, Strauss saw to it that Oppenheimer be pilloried in short order before the American public, in the very hearing that Oppenheimer requested in the hope of regaining his security clearance.

For three and a half weeks, beginning in April 1954, a three-man board conducted a so-called inquiry that seemed more like a trial. Trying first to defend his protecting Chevalier from the authorities and then embroidering the truth to make his friend seem all the more guilty in the authorities' eyes, Oppenheimer tied himself in explanatory knots of confusion that made him seem more guilty than he actually was. Under relentless prosecutorial grilling he sputtered that he had earlier deceived investigators "because I was an idiot," and he finally admitted that he had lied about nothing less than a treasonable overture. That lie he could not explain—but Bird and Sherwin attempt to explain it by citing a remark Oppenheimer made five years earlier to a Communist graduate student and friend of his, in which he admitted "his tendency when things get too much" to blurt out "irrational things." How difficult it must have been for an intellectual of his abilities, pride, and accomplishment to make such an admission ordinary men can only imagine.

In the course of the interrogation, Oppenheimer gave up the names of friends, his own and those of Jean Tatlock, who were Communists or fellow travelers. General Groves, caught in a hammerlock by Strauss, who discovered that Groves had concealed

what Robert Oppenheimer had told him in 1943 or 1944 about Chevalier, testified that Oppenheimer's deception about the Chevalier affair may have stemmed from his desire to protect his brother, Frank Oppenheimer. Frank was a Communist, and Groves speculated that he may have been implicated in the espionage operation for which Chevalier was a recruiter. (Frank Oppenheimer had already been blacklisted for academic jobs, and since 1949 he had earned his living as a cattle rancher in Colorado. Finally, in 1959, the University of Colorado gave him a job teaching physics. He later designed the Exploratorium science museum in San Francisco.)

The most damning testimony against Oppenheimer came from his own mouth, but the witness most reviled for bringing Oppenheimer down was his old rival Edward Teller. Although Teller stated that he believed Oppenheimer was loyal to the United States, he also professed himself baffled by some of Oppenheimer's decisions, openly disagreed with others, and pronounced some of Oppenheimer's actions "confused and complicated." Put simply, Teller would rather have someone with better judgment than Oppenheimer shaping U.S. nuclear policy: "If it is a question of wisdom and judgment, as demonstrated by actions since 1945, then I would say one would be wiser not to grant clearance." Leaving the hearing room, Teller said to Oppenheimer, "I'm sorry," and extended his hand to him. Oppenheimer shook Teller's hand, probably too stunned to do anything else, but gathered the presence of mind to note, "After what you've just said, I don't know what you mean."

The hearing board voted 2-1 not to reinstate Oppenheimer's security clearance. Of the two men voting against Oppenheimer, Bird and Sherwin write, "what they were saying was that they opposed Oppenheimer's judgments and they did not want his views represented in the counsels of government. Oppenheimer wanted to corral and perhaps even reverse the nuclear arms race. He wanted to encourage an open democratic debate on whether the United States should adopt genocide as its primary defense strategy. Apparently, Gray and Morgan considered these sentiments unacceptable in 1954. More, they were asserting in effect that it was not legitimate, not permissible, for a scientist to express strong disagreement on matters of military policy." This assessment of motives is partially foolish and partially sound. Genocide was never the primary defense strategy of the United States: had the government wished to conduct a genocidal war against the Soviet Union, it could have done so, when it had the A-bomb for years while the Soviets did not, and when it had the H-bomb for a year and a half while the Soviets did not.

Nevertheless, the government did intend to make an example out of Oppenheimer: as a scientist who thought himself more prudent than the politicians and military men. Although other scientists were shaken by the Oppenheimer decision, and feared they might be next to be hauled over the coals, the government intention backfired: 493 Los Alamos scientists and 214 more from the Argonne National Laboratory—centers of nuclear weapons research—signed a protest against the verdict. Carson Mark, who had been an essential figure in the H-bomb project, likened the Oppenheimer trial to the "Salem witchcraft delusion." Rather than cow the scientists, as Bird and Sherwin argue the Oppenheimer show trial did ("Oppenheimer's defeat was also a defeat for American liberalism"), the decision inflamed and emboldened them; it made them more confident than ever of their own probity and good sense.

As for Oppenheimer, he withdrew from public life to head the Institute for Advanced Study in Princeton, attracting world-class physicists and other intellectual leading lights to a sort of academic utopia, where they were free to pursue their work just as they chose. Bird and Sherwin see this return of Oppenheimer's to the academic cloister as a thrashing for the forces of enlightenment, which should have been deciding on the most urgent matters of public policy rather than relegated to the academic sidelines or reduced to mere technicians in the service of political men. "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." It is natural enough that the men who designed the bombs should consider themselves most capable of deciding how best to use or not use them; but then, intellectual pride being what it is, it is only natural that men gifted in one sphere of thought should imagine themselves equally gifted in others, when in fact they are not.

The record of Oppenheimer's own divided mind shows that technical expertise is something very different from prudence. That he was a superb technician, even that he was a man of acute sensibility, did not make him a public philosopher or statesman. He felt everything—pride in his competence and leadership during the Second World War, pride in his noble intransigence during the Cold War, intellectual pleasure in what he called the "technically sweet" conception of the H-bomb, self-disgust that he could feel such pleasure in so monstrous a creation—but could decide on nothing. Brilliance of this scat-

tershot type effectively disqualifies a man from political decision-making. Oppenheimer was simply not the sort of man a nation can entrust with its fate.

In 1966 Oppenheimer was diagnosed with cancer of the throat, caused by forty years of heavy smoking. As Oppenheimer's death approached, Freeman Dyson, his former subordinate at Los Alamos and his colleague at the Institute for Advanced Study, found him ever finer in spirit: "He accepted his fate gracefully; he carried on with his job; he never complained; he became quite suddenly simple and no longer trying to impress anybody." He was noblest toward the end, and seeing him frail and dying, one thinks of both the private man and the public life he led—a life with consequences beyond the state of his own soul.

In *The Ruin of J. Robert Oppenheimer*, Harvard scholar Priscilla J. McMillan examines that sad wreckage of his public career like a child observing insects through a magnifying glass: detail unseen by the naked eye looms big as life but grossly distorted, so the overall impression is of a horror show: malign right-wing spiders draining the life out of an unfortunate fly that meant no one any harm. A general presumption of fatuousness and viciousness on the part of Oppenheimer's opponents dominates McMillan's thinking: they are villains plain and simple, bereft of serious ideas—for surely no sensible person can regard 1950s anti-Communism as intellectually serious—and driven by petty grievances and savage compulsions they were either unaware of or simply unwilling to acknowledge. Admittedly, sometimes McMillan's attribution of low motives seems plausible or even convincing—one can well believe that Strauss's social envy of Oppenheimer, or his resentment for a cutting remark at his expense, played some part in his antagonism, or that Teller's vanity made him want to crush his detractors. But even then one cannot but notice that the essence of the story, the clash of fundamental ideas about political good and evil, about democracy and Communist tyranny, is missing entirely. From the first page of this book, where McMillan writes of the "disagreement" between the U.S. and U.S.S.R. as "harden[ing] into a state of permanent tension," there sounds the familiar squealing note of childish liberal make-believe, the naïve faith that disagreements can of course be smoothed out by reasonable and well-meaning people, so that this hardening into antipathy can only be a failure to act on our better angels. McMillan prefers to believe that if only the United States had been more considerate of Soviet feelings, the unpleasantness of the nuclear arms race could have been avoided. Considering the first Soviet H-bomb test in 1954, a year and a half after the first such American test, she writes, "Once again—Hiroshima in

1945 being the first time, Truman's H-bomb announcement of 1950 the second, and [the U.S. H-bomb test] Mike in 1952 the third—the United States led the way in the competition to build weapons of mass destruction." She scatters similar observations in passing, implying that the United States was in fact more culpable than the Soviet Union in bringing on and prolonging the Cold War; McMillan assumes the Soviets were only playing catch-up, and that they wouldn't have played at all if the United States hadn't bullied them into joining the brutal game. That the Soviet regime was the foremost danger to freedom once the Nazis and imperial Japanese were defeated is simply not an acceptable thought in McMillan's world.

And without a clear awareness that the Cold War was a holding action against totalitarian evil, the case of Oppenheimer would remain a muddle, or a vulgar rallying cry for liberal bitterness under the assumed name of moral superiority. Both the ambiguity of Oppenheimer's legacy and the moral complexity of the nuclear age are flattened entirely. McMillan does cite one of the great liberal heroes among atomic scientists who openly believed that atomic weapons were indispensable to the cause of freedom: Niels Bohr, in asking his American colleague John Wheeler in 1950, "Do you for a moment imagine that Europe would be free of Soviet control today were it not for the atomic bomb?" After considering his mentor's remark, Wheeler put aside his misgivings and went to work on H-bomb research at Los Alamos. From this, McMillan draws the following conclusion: "So it was to go with decision after decision for forty years, and with each upward ratchet of the arms race, each side became less secure."

The truth, of course, is that the nuclear stand-off of the Cold War might have ensured a form of security—though a nerve-wracking one—that kept the conflict from becoming fatally hot. The Second World War killed nearly 50 million people. The various subsequent wars that for 45 years engaged the United States, the Soviet Union, and their allies or surrogates did not come close to such terrible loss of life. Under the nuclear dispensation, anxiety that taking a step too far might trigger nuclear war enforced restraint upon nations with good reason to hate each other. When the H-bomb raised the stakes yet again, it became clear that actually fighting a thermonuclear war would be insane but that threatening to fight one was a necessity; the doctrine of deterrence, based on mutual assured destruction, not only prevented thermonuclear war, but also prevented conventional wars from rampaging out of control.

Machiavelli, so widely considered the founding father of modern political morality, or immo-

rality, understood prudence, or the ability to choose among possible courses of action, as the *sine qua non* of the conqueror. But in the atomic age, the foremost aim of prudence among more or less decent nations is no longer to conquer but to avoid annihilation, while also avoiding the evil of annihilating the enemy—i.e., nuclear genocide. In October 1949, the General Advisory Committee to the AEC recommended that "*a super bomb should never be produced*"—that it "might become a weapon of genocide." Oppenheimer was one of the signatories. To assume that the Soviet enemy would share this American scrupulousness was the committee's fallacy; and to make such an assumption of Stalin was the depth of folly. At this point in his life, Oppenheimer, haunted by his leading role in the first use of atomic weapons, understood only one aspect of prudence. His longing not to do evil himself blinded him to the need to ward off the evil of others. This painfully knotted man hoped with one swipe of his moral sword to rid himself of the impossible tangle and to be clear and simple for once in his life. But being Oppenheimer could never be as easy as that.

For Oppenheimer embodied two of the highest human types, the theoretical man described by Aristotle as god-like for living in the mind, among changeless truths, and the paragon of Machiavellian virtue, god-like in commanding the power of life and death over other men. No theoretical man before Oppenheimer had known such lordly power. In certain high moments he approached that Aristotelian theoretical purity which lives for the joys of knowing the world, whatever it might prove to be; in another light he thrilled at that Machiavellian power and its attendant renown; in contrary moods he reviled himself for the suffering he brought into the world, and ached to renounce his distinction and to be merely another man among men. Perhaps no theoretical man can be equal to such a burden: to feel knowledge as power when one's mind reshapes the world irrevocably, to see the light of truth as the agent of some dark majesty, is not grace but ordeal. Oppenheimer's agony tore him open from top to bottom. More important than any political dispute his biographers may hope to re-animate or even to settle is a sense of that agony: what it means to be a man desiring scientific and political and moral greatness and living out the crucial ideas and struggles of our time, which pierce like knives, and rend the flesh and the spirit, and allow not a moment's relief.

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