Within a short time after the United States bombed the Japanese cities of Hiroshima and Nagasaki with nuclear weapons in August 1945, many observers labeled the coming era as the “atomic age.” They also expressed deep ambivalence about the potential consequences – military, diplomatic, political, economic, and cultural – that might accompany the scientific achievement of nuclear fission. Their gratitude that the bombs had brought a prompt end to the war in the Pacific was tempered by obvious uneasiness. “With the controlled splitting of the atom, humanity, already profoundly perplexed and disunited, was brought inescapably into a new age in which all things were split – and far from controlled,” declared *Time* magazine in its first coverage of the bomb (“The Bomb,” 1945, p. 19).

The dawn of the atomic age offered both an unprecedented threat and, perhaps, abundant promise. The threat was that the same weapons that forced the Japanese surrender could be used against the United States in future wars or could even destroy the world. The promise was that nuclear energy could be employed for peaceful applications that would improve the quality of life throughout the world, including power plants, treatments for cancer, and more fancifully, airplanes, trains, and automobiles. *Newsweek* told its readers that atomic energy could produce “a civilization which would make the comic-strip prophecies of Buck Rogers look obsolete” (“For the Future,” 1945, p. 59). The atomic age began with a rush of mixed emotions and disquieting uncertainty. “The whole revelation of the fission of the atom has come with such a sudden thunderclap,” commented the *New York Times* three days after Hiroshima, “that one is left bewildered and at a loss to know which of its many implications . . . may prove to be substantial and real, and which chimerical” (“Atomic Power,” 1945, p. 20).

Although the term “atomic age” has commonly served since 1945 as a catch-all phrase to refer to the postwar world, its explanatory power is limited. The term itself was used as early as 1921 in *Science* magazine, but it remains an imprecise and inchoate concept. In some cases, it appears as a synonym for the “Cold War,” and the influence of atomic weapons on the course of the decades-long confrontation between the United States and the Soviet Union was, by any standard, enormous.
Nevertheless, much of what happened during the Cold War—Soviet–American tensions, the division of Europe, rivalry in the developing world, arms competition, the space race, and intense fear of communism in the United States—could have and probably would have occurred if the atomic bomb had never been invented. Nuclear weapons made every international crisis a potentially terrifying event, but the “atomic age” remained a subset of the Cold War era. In this essay, “atomic age” refers to the ways in which the fears and the hopes about atomic energy that became prominent immediately after World War II played out in the ensuing decades. In keeping with the limited utility of the term, scholars have not provided an overall interpretive framework for the “atomic age.” They have generally written about discrete topics relating to nuclear weapons and nuclear power, and used those topics to shed light on themes that were not strictly nuclear, such as the Cold War, détente, energy policies, the performances of different presidential administrations, and social and cultural developments.

The subject that has received the most attention and debate is President Harry S. Truman’s decision to use atomic bombs against Japan. Immediately after the war, the American people overwhelmingly approved Truman’s action, despite their misgivings about the long-term dangers that the bomb imposed. Strong popular support reflected the conviction that the atomic bombs had been essential to compel the Japanese surrender and end the war. A few critics questioned the need for and the morality of dropping the atomic bombs, but the influence of their arguments, at least initially, was slight. In later years, however, the question of whether the atomic bomb was needed to bring about a Japanese surrender at the earliest possible moment generated sharp debate among scholars.

The traditional interpretation, advanced by such scholars as Herbert Feis (1961), Robert H. Ferrell (1994), Robert James Maddox (1995), and Robert P. Newman (1995), was that the bomb was required to end the war promptly and prevent an invasion of Japan that would have caused hundreds of thousands of American casualties. It drew heavily on the explanations for the use of the bomb that Truman and his chief advisors offered. Writers who took this position asserted or implied that Truman faced a categorical choice between the bomb and an invasion that was forced on him by the refusal of the Japanese to surrender. In their view, the United States dropped the bomb primarily for military purposes—to shorten the war and save huge numbers of American lives.

The traditional interpretation was sharply disputed by scholars known as revisionists, including Gar Alperovitz (1965), Robert Jay Lifton and Greg Mitchell (1995), Ronald Takaki (1995), and Kai Bird and Lawrence Lifschultz (1998). The revisionist argument that Alperovitz offered in his controversial 1965 book gained credibility during the late 1960s and early 1970s as a part of increasing scholarly criticism of Truman’s foreign policies. Revisionists contended that the bomb was not necessary for victory because the Japanese were so weak by the summer of 1945 that they were ready to quit the war on the sole condition that their emperor be retained. Revisionists further insisted that American policymakers were well aware of Japan’s intentions. In their judgment, the United States used atomic weapons more for political than for military reasons, especially to intimidate the Soviet Union in the emerging Cold War.

The revisionist view made a considerable impact on scholarly accounts of Truman’s decision, though few accepted it in unadulterated form. By the mid-1970s scholars
had reached a general but hardly unanimous consensus that combined features of both the traditional and revisionist interpretations. It held that Truman used the bomb primarily for military reasons and secondarily for political ones. Scholars further concurred that Truman and his closest advisers were well aware of alternatives to the bomb that might have ended the war within a relatively short time, though their agreement did not extend to the more important question of whether the options would have been preferable to dropping the bomb.

After decades of research and debate, specialists on the subject had moved far beyond the traditional view that Truman’s options for ending the war were either the bomb or an enormously costly invasion of Japan. They showed that the situation that faced Truman was vastly more complex. Their research and conclusions, however, were not widely known to the general public, which remained wedded to the traditional interpretation. The chasm between the mythological dogma that the public embraced and the findings of scholars who studied the documentary sources led to a bitter controversy when the Smithsonian Institution’s National Air and Space Museum made plans in the early 1990s to present a major exhibit on the bomb and the end of World War II. Museum curators designed an exhibit that was intended both to commemorate the valor and sacrifices of American war veterans on the fiftieth anniversary of the end of the war and to reflect recent scholarly investigations on the use of the atomic bomb. By raising questions about the traditional interpretation of why the United States dropped the bomb, the original script for the exhibit set off a firestorm of protest. Critics claimed that the Smithsonian had adopted a revisionist perspective, which in their analyses usually meant any departure from the traditional position. Historians who defended the script pointed out that a large volume of historical evidence did not support a view that Truman faced a categorical choice between the bomb and an invasion. But their arguments made no discernible impact on those who objected to the script, and the Smithsonian, in an effort to still the controversy, sharply scaled back the exhibit.

Within a short time after the planned Enola Gay exhibit commanded national headlines, several scholars, including Barton J. Bernstein (1995), J. Samuel Walker (1997), Richard B. Frank (1999), and Herbert Bix (2000), published new studies that, without endorsing the discredited elements of the traditional view, pointed out serious flaws in the revisionist interpretation. They demonstrated major weaknesses in the most cherished revisionist contention – that Truman and his advisers knew that alternatives to the bomb, especially guaranteeing the status of the emperor, would end the war promptly on a basis satisfactory to the United States. They showed beyond reasonable doubt that the Japanese government had not decided to surrender and did not do so until after Hiroshima. The new studies also suggested, with varying but still high levels of certainty, that the available alternatives to the bomb would not have ended the war as quickly. The newer scholarship reaffirmed the broad consensus that had originally emerged in the 1970s, which held that neither the traditional nor the revisionist interpretation of Truman’s decision to use the bomb was sound in its pure form.

Nevertheless, heated debate over specific issues continued. The issue that generated the most controversy between 1995 and 2000 was estimated American casualties for an invasion of Japan that military experts calculated in the summer of 1945. During the 1980s, newly opened documentary sources indicated that top military
analysts had not predicted American casualties in the hundreds of thousands if a landing proved to be necessary. Supporters of the traditional view insisted that Truman received projections in the hundreds of thousands before he authorized dropping the bomb, while revisionists cited the smaller numbers as evidence that the bomb was unnecessary. Moderates who stood between the extremes pointed out that the tens of thousands of American deaths that military experts estimated before Hiroshima were very large numbers that in Truman’s mind provided ample reason to use the bomb, even if the projections were far lower than he claimed after the war.

Much of the debate over the use of atomic bombs against Japan centered on counterfactual arguments, that is, judgments that were not based on hard evidence but on speculation about what might have happened. They included, for example: how long the war would have continued if the bomb had not been dropped; how many casualties American forces would have suffered if an invasion had occurred or even if the war had gone on for a few more weeks without an invasion; whether Japan would have responded favorably to an American offer to guarantee the status of the emperor before Hiroshima or whether such an offer would have prolonged the war; and whether any of the other alternatives to the use of the bomb would have ended the war as quickly in a way that was acceptable to the United States. Those questions go to the heart of the historiographical conflicts over Truman’s decision, and although much important new evidence about the end of the war has opened over the past two decades, it cannot settle in a definitive way the debate over counterfactuals. The rich abundance of documentary sources on the use of the bomb shows that both the traditional and the revisionist interpretations are oversimplified, incomplete, and inadequate. But there still is ample room for disagreement among scholars, and the battle over the events that led to Hiroshima seems destined to carry on.

The nuclear arms race that followed quickly in the wake of Hiroshima and Nagasaki was a major component of the immense volume of literature on the origins of the Cold War. The scholarly debate over the Cold War that erupted in the 1960s focused on the question of whether the United States or the Soviet Union was primarily responsible for provoking it. In contrast to the traditional view that the US buildup of nuclear arms was necessary to contain Soviet expansion, critics suggested that the American monopoly of the bomb made it more aggressive, dogmatic, and imperious than it would otherwise have been. In that way the bomb was a major contributor, if not the leading cause, of the Cold War. The culmination of the emerging nuclear arms race was Truman’s approval of a crash program to develop a hydrogen bomb in early 1950. The hydrogen bomb promised an explosive yield a thousand times greater than the comparatively primitive weapons that the United States employed against Japan. Success in designing and building a hydrogen bomb, which were not sure things, opened a new and more ominous phase of the growing nuclear competition between the world’s superpowers.

The judgments that scholars made about Truman’s nuclear weapons programs ranged, on the one hand, from resigned acceptance that he was forced to ensure American superiority to, on the other hand, condemnation that he deserved the bulk of the blame for the arms race. For most of the Cold War era, those positions were based on the information available from American sources. The collapse of the Soviet
Union made it possible for scholars to examine important Soviet documentary collections that previously had been tightly closed. The availability of Soviet sources, though far from comprehensive, placed the early Cold War and the beginning of the arms race in a new light. As David Holloway made clear, once the United States demonstrated the power of the atomic bomb, Stalin was determined to have his own. Stalin qualified as the first revisionist on why Truman used the bomb. Although nearly all scholars now agree that Truman dropped the bomb primarily to end the Pacific war as quickly as possible, Stalin immediately concluded that it was aimed at him. He regarded the bomb as a serious threat to the long-term position of the Soviet Union by distorting the balance of power. “Hiroshima has shaken the whole world,” he reportedly remarked. “The balance has been destroyed” (Holloway, 1994, p. 132).

Given Stalin’s reaction to the bomb, it appears that the arms race, at least in some form, was inevitable. The Soviets immediately launched a massive effort to build an atomic bomb, supported not only by their own cadre of able scientists but also by information that they had received from spies on the Manhattan Project. Their commitment to matching the atomic achievement of the United States made it improbable that they would have agreed to any meaningful limitations on developing nuclear weapons. There certainly was no chance that they would go along with the proposals that the United States offered. The Soviets tested their first atomic bomb in August 1949 and immediately accelerated their work on a hydrogen bomb.

Within a short time after the end of World War II, the principal feature of the atomic age was an increasingly perilous and terrifying nuclear arms race. When Dwight D. Eisenhower became president in January 1953, both the United States and the Soviet Union were well on their way to staggering increases in the size and power of their nuclear arsenals. Eisenhower’s nuclear programs have received a great deal of attention, much of it framed within a context of his performance in the White House. In the early 1980s, several scholars, notably Robert A. Divine (1981), Fred I. Greenstein (1982), and Stephen E. Ambrose (1984), advanced the view that, contrary to earlier perceptions, Eisenhower was a strong, active, and capable leader who was fully in charge of the diplomatic policies of his administration. The so-called “Eisenhower revisionists” (who should not be confused with atomic bomb or Cold War revisionists) hailed the president for recognizing the dangers of the arms race and taking meaningful steps to curtail it.

Most scholars accepted the argument that Eisenhower was a forceful and skillful leader but many took issue with revisionist claims about his approach to nuclear arms. They pointed out that despite his abhorrence of the prospect of nuclear war, the size of the US nuclear arsenal increased astronomically under his administration. As David Alan Rosenberg (1983) demonstrated, for example, Eisenhower presided over the “origins of overkill” even as he sought ways to limit the arms buildup. Further, critics of the revisionist position, such as H. W. Brands (1989), Peter J. Roman (1995), and Jeremi Suri (1997), argued that whatever Eisenhower’s intentions, he failed to slow the arms race, adopt a clear position on US nuclear strategy, or substantially improve relations with the Soviet Union.

During Eisenhower’s presidency, another alarming aspect of the atomic age rose to prominence – radioactive fallout from atmospheric nuclear bomb testing. Initial reactions to the bombings of Hiroshima and Nagasaki focused on the force of the
blasts rather than the effects of radiation. Knowledge of and concern about radiation gradually increased after the war, and, as a result of the atmospheric testing of atomic and hydrogen bombs, the public health risks of radioactive fallout became the source of a major scientific and political controversy. The magnitude of the risks of population exposure to low levels of radiation generated sustained and deepening public anxiety because bomb tests by the United States, the Soviet Union, and Great Britain produced radioactive fallout that spread to populated areas far from the sites of the explosions.

The US Atomic Energy Commission (AEC), which was responsible for conducting the American tests, insisted that the levels of radiation in fallout were too low to threaten public health significantly and that the risks of testing were less dangerous than losing ground to the Soviets in the arms race. Critics of the AEC contended that it underestimated the chances that fallout would cause increased rates of cancer, birth defects, and other afflictions. By moving radiation effects from scientific journals to a featured subject in the popular news media, the fallout debate greatly expanded public awareness of and concern about the hazards of low-level exposure. It also seriously damaged the credibility of the AEC because the agency’s responsibilities for testing nuclear weapons made its evaluations of fallout risks highly suspect. The fallout controversy sharply elevated public fears of radiation and doubts about weapons testing, and in that way had an important impact on the atomic age. It has received some attention from scholars, including Robert A. Divine (1978), George T. Mazuzan and J. Samuel Walker (1984), Richard G. Hewlett and Jack M. Holl (1989), and Allan M. Winkler (1993), but perhaps less than it deserves.

When John F. Kennedy replaced Eisenhower as president, the nuclear arms race had taken on new and more dangerous dimensions because of the availability of ballistic missiles that could deliver warheads within a matter of minutes after launching. During the presidential campaign of 1960, Kennedy criticized the Eisenhower administration for creating a “missile gap” by allowing the Soviets to move ahead of the United States in missile development. There was indeed a missile gap, but contrary to Kennedy’s assertions, it heavily favored the United States. After taking office, Kennedy still authorized the construction of new nuclear delivery systems – missiles, submarines, and bombers – that fueled the arms race, though he approved fewer than his military advisers sought. Both the United States and the Soviet Union strove to improve and enlarge their nuclear capabilities. In the summer of 1961, Soviet premier Nikita Khrushchev decided to stop observing a voluntary moratorium on atmospheric nuclear weapons testing. Kennedy reluctantly followed suit. The result was a series of tests that heightened already growing international tensions and renewed concern about the effects of fallout.

In a diplomatic climate of mutual fear and suspicion, the gravest crisis of the Cold War era erupted when Khrushchev decided to place nuclear missiles in Cuba. The Cuban Missile Crisis, which came closer to causing a nuclear war between the United States and the Soviet Union than any other event, has been the focus of enormous interest. Scholars offered a variety of evaluations of how it came about and how it was handled by the Kennedy administration. The first accounts of the missile crisis were laudatory, if not hagiographical, treatments of Kennedy’s performance. Arthur M. Schlesinger, Jr. (1965, p. 841), for example, maintained that the president’s response to Khrushchev’s reckless venture was “so brilliantly controlled, so match-
lessly calibrated, that [it] dazzled the world.” By the early 1970s, however, critics of Kennedy’s foreign policies, including Richard J. Walton (1972), Louise FitzSimons (1972), and Henry Fairlie (1973), had offered a considerably less favorable view of his actions. They suggested that at best he overreacted to the Soviet challenge, and at worst, caused the crisis by his efforts to oust Fidel Castro from power in Cuba. Those allegations received support later in the 1970s from revelations that the Kennedy administration, perhaps with the president’s knowledge, had conspired to assassinate Castro.

The opening of new evidence from both US and Soviet sources, including oral histories and conferences in which former high-level officials of both nations recounted their experiences, provided a much more thorough and balanced view of the Cuban affair. Several studies that drew on the new sources, such as books by Raymond L. Garthoff (1989), Michael R. Beschloss (1991), Mark J. White (1997), and Aleksandr Fursenko and Timothy Naftali (1997), did not confirm the portrait of Kennedy as either a peerless hero or a malevolent villain. Scholars generally concluded that once the crisis began, both Kennedy and Khrushchev acted responsibly and prudently to avoid a nuclear war. Operating under tremendous pressure and bewildering uncertainty, they elected to seek a negotiated settlement to the crisis rather than opting for a military confrontation. Recent scholarship has demonstrated that despite the efforts of the two leaders, the situation could have spun out of control. One major revelation, for example, was that unbeknownst to American officials, the Soviets had placed several tactical nuclear warheads in Cuba (in addition to the strategic missile sites that the United States discovered). An American attack on Cuba, which was one option favored by Kennedy’s more militant advisers, could have triggered a nuclear response that escalated into nuclear war.

The missile crisis continues to provide fertile ground for debate among scholars on a number of vital questions. They center on matters that include the motivations that led Khrushchev to send missiles to Cuba, the importance of Castro in initiating and sustaining the crisis, the influence of various considerations (especially domestic politics) that Kennedy and his advisers weighed in reaching decisions, and the role of diplomatic issues such as tensions over Berlin and the presence of American missiles in Turkey. Whatever conclusions scholars may reach on those issues, there is little question that the missile crisis convinced Kennedy and Khrushchev that they must try to reduce Cold War hostilities. In the wake of the Cuban face-off, both sought to ease ill-will. One significant result was the first nuclear arms control agreement, the Limited Test Ban Treaty of 1963. It prohibited nuclear weapons testing in the atmosphere and underwater by signatory nations. Although it did not terminate nuclear testing underground by signatories or in the atmosphere by nonsignatory nations, most Americans regarded it as a useful step that greatly diminished the problem of radioactive fallout from weapons tests.

In the aftermath of the Cuban Missile Crisis and the Limited Test Ban Treaty, nuclear arms issues lost much of their visibility and at least some of their urgency. The arms race continued, but in the next two decades, other problems generated much more controversy, including the civil rights movement, the energy crisis, the Watergate scandal, and on the foreign policy front, the Vietnam War. Questions relating to nuclear weapons development and proliferation and their impact on relations with the Soviet Union were hardly ignored, but they did not command the
paramount importance with which they were treated during the Truman, Eisenhower, and Kennedy administrations. Presidents Lyndon B. Johnson, Richard M. Nixon, Gerald R. Ford, and Jimmy Carter sought ways to curb the arms race and to ease Cold War tensions. Their efforts paid off with major achievements such as the Nuclear Non-Proliferation Treaty (1968), the Strategic Arms Limitation Talks (SALT) agreement (1972), and at least for a time, progress toward détente with the Soviets.

The arms control agreements of the 1970s, including the first SALT treaty and a second one that was aborted, generated considerable debate. Opponents of the agreements insisted that the Soviet Union could not be trusted to observe the limitations, and furthermore, that SALT-I and SALT-II were giveaways that favored the Soviets. Supporters contended that they would prevent the Soviets from racing ahead of the United States in their nuclear capabilities. The debate over arms control was critical to the fate of US–Soviet détente. Those issues have been well covered and well analyzed by many scholars of the period, but no major historiographical disputes have emerged – probably a reflection of the diminished importance attached to issues of nuclear arms development and control.

Although the objective of arms control won wide popular support, the provisions of the SALT agreements were so complex and so arcane that only knowledgeable experts could discern their meaning and potential impact. The accounts of John Newhouse (1973) on SALT-I and Strobe Talbott (1979) on SALT-II, for example, demonstrated how mind-numbing arms control issues had become. This made them susceptible to oversimplified analyses that opponents of the treaties marshaled to claim that the agreements delivered one-sided advantages that would enable the Soviet Union to achieve nuclear superiority. By the late 1970s, critics of the Carter administration’s foreign policies, including former high-level government officials, had organized a well-publicized campaign that asserted that the United States had fallen behind the Soviets and made itself vulnerable to nuclear blackmail. They claimed that the very survival of the United States was threatened by a massive Soviet military expansion that would enable the Soviet Union to fight and win a nuclear war. This view gained new prominence in 1980 when presidential candidate Ronald Reagan charged that Carter had weakened American defenses and called for a rapid military buildup to counter the Soviet offensive.

Immediately after assuming office in 1981, Reagan secured enormous increases in the defense budget, which was already growing at the end of Carter’s presidency. He used the funds to, among other things, augment and modernize US nuclear forces with new strategic bombers, missile-launching submarines, and ballistic missiles. Administration officials insisted that those measures were essential to protect against the Soviets’ potential for successfully waging nuclear war. One prominent feature of Reagan’s program was his proposal in 1983 to build a defense system that could intercept ballistic missiles launched against the United States. This was called the “Strategic Defense Initiative” (SDI), but was more commonly referred to as “Star Wars.”

Reagan’s national security policies redefined the political landscape, and in so doing, created a great deal of controversy in the popular and scholarly literature. The major source of debate was whether Reagan’s arms buildup and his missile defense proposal caused the demise of the Soviet Union and won the Cold War. Reagan supporters asserted that the president’s programs were instrumental in bankrupting the
Soviets and making clear to them that they could not defeat the United States. Others took issue by arguing that the Soviet Union was teetering on the brink of collapse in any event, and that it was mostly Soviet premier Mikhail Gorbachev’s actions rather than Reagan’s that ended the Cold War. Much of the literature is partisan, and little is based on still-closed primary sources. The book that is likely to serve as the focal point for debate is Frances Fitzgerald’s *Way Out There in the Blue* (2000). She sharply criticized Reagan and his advisers, notably Secretary of Defense Caspar Weinberger, for pursuing costly military technologies, especially “Star Wars,” rather than less glamorous but more substantial and more feasible arms control agreements. She not only denied that SDI played any significant role in the dissolution of the Soviet Union, but also maintained that Reagan’s commitment to it prevented fruitful negotiations on arms limitation.

The end of the Cold War occurred long after the end of the “atomic age,” which had largely disappeared by the mid-1960s, at least in the ways that had been predicted shortly after Hiroshima. By that time, the prominence and frequent dominance of atomic energy issues in diplomacy, politics, and culture had declined, without being entirely replaced, by other concerns. In the immediate aftermath of World War II, popular attitudes toward the atom had shown keen ambivalence – anxiety about the threat of nuclear weapons mixed with hopes, many of them inflated, about the promise of peaceful uses of atomic energy. In a lecture he gave in 1963, David E. Lilienthal, who had served as the first chairman of the AEC from 1946 until 1950, addressed the question of “whatever happened to the peaceful atom?” He argued that although progress had been made in developing nuclear power and other civilian technologies, the “glamour, the excitement of the boundless possibilities of power from the peaceful atom is gone.” “The peaceful atom,” he added, “has not ushered in a ‘new world’ but has rather become a part, a minor part, of the old one” (Lilienthal, 1963, pp. 709, 714).

The ambivalence about nuclear energy that had emerged in the wake of World War II gradually gave way to growing opposition. As anxieties about the atom prevailed over hopes for its peaceful applications, the atomic age was supplanted by what might be termed the “anti-nuclear age.” Although anti-nuclear attitudes were far from universal, after the mid-1960s, the dominant political and cultural trends increasingly emphasized the dangers and risks of nuclear energy over its potential benefits. The crucial event in transforming popular views of nuclear energy was the fallout controversy of the late 1950s and early 1960s. The debate alerted the American people to the possible risks of exposure to low levels of radiation and raised their concern about radiation hazards from any source. Although it was clear that acute doses of radiation could cause serious injury or death, the scientific evidence about the effects of low-level radiation was inconclusive.

Greater public knowledge about fallout was accompanied by heightened fear of radiation from nuclear power and other sources. The nuclear power industry did not exist until after Congress enacted a law in 1954 that eased restrictions on access to information about atomic energy and that made commercial applications of nuclear technology possible for the first time. The law assigned the AEC responsibility for both promoting the development and regulating the safety of nuclear power. In the late 1960s, nuclear power underwent a sudden and unexpected boom as utilities ordered nuclear units in record numbers. As the number of nuclear plants on order
rapidly expanded, the size of individual facilities also dramatically increased. The arrival of commercial nuclear power placed unprecedented demands on the AEC by raising new safety problems.

The growth of the nuclear power industry coincided with the emergence of the environmental movement in the United States. Nuclear power soon became a prime target of environmentalists. In the early 1960s, protests against the construction of some nuclear plants, based largely on public fear of radiation, helped lead to their cancellation. In the late 1960s and early 1970s, several critics of nuclear power made headlines by charging that the AEC’s regulations for protecting against radiation hazards were too lax. They suggested that even routine emissions of low levels of radiation from nuclear plants could cause thousands of cancer deaths annually. The AEC and most radiation experts denied those allegations, but their arguments were not convincing to those who had doubts about the impact of the nuclear boom. E. F. Schumacher, an economist and technology critic, for example, described radiation in 1973 as “the most serious agent of pollution of the environment and the greatest threat to man’s survival on earth” (Schumacher, 1989, p. 143).

In addition to radiation emissions, environmentalists raised questions about other aspects of nuclear power, including thermal pollution of waterways from the discharge of waste heat, the disposal of radioactive wastes, and the safety of plants. Nuclear power safety became a front-page issue in the early 1970s when the AEC held hearings on the performance of emergency core cooling systems, which were designed to dump huge quantities of water into the reactor core in the event of a serious accident. The reservations cited by opponents of nuclear power produced a highly visible and bitter controversy during the 1970s. Those who objected to the technology asserted that it was unsafe and unnecessary. Supporters of nuclear power countered that it was essential for meeting the nation’s energy needs and that its risks were small. They insisted that the chances of an accident that threatened public health were remote.

The anti-nuclear position won new recruits when the most serious nuclear plant accident in the United States occurred at the Three Mile Island station near Harrisburg, Pennsylvania, on March 28, 1979. Following a series of mechanical failures, compounded by human errors, the accident uncovered the reactor’s core and melted about half of it. Uncertainty about the causes of the problem and confusion about how to deal with it among utility and government officials fed public fears that the plant would release large and dangerous amounts of radiation to the environment. By the time that the plant was finally brought under control, the credibility of nuclear critics who had argued that no facility as complex as a nuclear plant could be made foolproof was greatly enhanced. The Washington Post captured this feeling in a headline that read: “The Day Few Believed Possible Arrives in the Atomic Age” (1979). Although the accident destroyed the plant, only small amounts of radiation, far below the permissible limits allowed by federal regulations, escaped into the environment. Several studies of the population in areas surrounding the plant over a twenty-year period conducted by the Pennsylvania Department of Health and by other researchers showed no increase in the incidence of cancer from radiation, though those results were contested by some critics.

Surprisingly, given the enormous controversy over the technology, there has been little historiographical debate over the subject of nuclear power. Indeed, historians
have not accorded it a great deal of attention. Most scholars who examined the subject took a position that leaned, sometimes sharply, toward the arguments of nuclear opponents. Although their tone, focus, and quality varied greatly, books by Gerard H. Clarfield and William M. Wiecek (1984), Peter Stoler (1985), John L. Campbell (1988), Catherine Caufield (1989), James M. Jasper (1990), Howard Ball (1993), Robert J. Duffy (1997), and Steven Mark Cohn (1997) were critical of the AEC’s regulatory performance. They depicted it as an ineffective regulator that was more attentive to the health of the nuclear industry than the health of the public. Those authors accepted at least some of the major allegations that nuclear activists made about the AEC’s safety programs, including: (1) the AEC’s dual responsibilities for promoting and regulating nuclear power made it a weak regulator that was disinclined to place tough requirements on the nuclear industry; (2) the AEC was so committed to the expansion of nuclear power that it disregarded, downplayed, or postponed vital reactor safety issues; (3) the AEC’s licensing process was unresponsive to public concerns and rigged to advance industry objectives; (4) the AEC’s radiation protection regulations failed to protect the public adequately and threatened to allow radiation exposures that could increase the incidence of cancer by alarming proportions; and (5) the AEC was largely indifferent to the environmental costs of nuclear power.

Few scholars questioned the negative treatment of the AEC that those books presented. The most comprehensive studies of the AEC’s regulatory programs took issue, however, with some important aspects of the prevailing view. A book by George T. Mazuzan and J. Samuel Walker (1984), and two others by Walker (1992, 2000), agreed that the AEC’s regulatory performance was hardly flawless and that the agency’s promotional priorities compromised its regulatory responsibilities. But they also pointed out that the AEC imposed many stringent safety requirements and argued that it did not operate in meek and heedless complicity with the interests of the nuclear industry. They suggested that the AEC was a more independent and conscientious regulator than its critics claimed.

Although most works on nuclear power focused on the AEC, and, to a lesser extent, on the nuclear industry, some books evaluated the dynamics of the nuclear debate by examining the growth of opposition to nuclear power. Brian Balogh (1991) showed that experts who became concerned about the safety of nuclear technology initially expressed their reservations within the bureaucratic channels of the AEC, which held a virtual monopoly on technical expertise in the early years of nuclear development. Gradually, other federal agencies, state and local governments, and outside organizations acquired their own expertise and were able to challenge the regulatory policies and decisions of the AEC. This process laid the foundations for the broad-based public debate over nuclear power that emerged by the early 1970s. Thomas R. Wellock (1998) took another approach by examining the development of grassroots challenges to nuclear power in California. He showed how local activists, motivated by reasons ranging from aesthetic sensibilities to the preservation of rural values, won their battles against the construction of nuclear plants. Citizen protests, he concluded, were instrumental in causing the decline of the nuclear industry in California and across the nation. Christian Joppke placed the rise of anti-nuclear protests in the United States and Germany in the context of differing political cultures. He found that although the movement in Germany was more radical than that
in the United States, in both nations it showed a “tendency . . . to demonize nuclear power as an imminent threat” (Joppke, 1993, p. 10).

The “anti-nuclear age” gathered momentum in response to growing doubts about nuclear power. It reached new heights in the 1980s in response to Reagan’s arms buildup and his anti-Soviet rhetoric and policies. A plethora of books, articles, films, television shows, and other presentations that reached a vast audience graphically described the horrors of nuclear war. In 1982, over 700,000 demonstrators participated in an anti-nuclear rally in New York City. The same year, Jonathan Schell’s widely circulated and influential book, *The Fate of the Earth*, took issue with the idea that a nuclear war could be won and vividly reminded readers that the existence of nuclear weapons could destroy the world. Nuclear arms, he wrote, held “this entire terrestrial creation hostage to nuclear destruction, threatening to hurl it back to the inanimate darkness from which it came” (Schell, 1982, p. 181). In 1983, the ABC television network ran a special, “The Day After,” watched by an estimated 100 million viewers, that dramatized the ghastly aftermath of a nuclear attack. At about the same time, scientists, religious leaders, politicians, and other citizens spearheaded a movement for a nuclear freeze that aimed to halt the arms race at existing levels of deployment. Despite strong opposition by the Reagan administration, it gained impressive support from a broad cross-section of American society. There was no ambivalence in the intensity of concern that critics expressed in a variety of forums about nuclear energy; their abhorrence of nuclear war often extended to all things nuclear.

The events of the “atomic age” and the “anti-nuclear age” made a great impact on American culture, and in turn, nuclear developments after World War II were significantly influenced by cultural trends. Some of the most original work done by scholars examined the cultural aspects of the history of nuclear energy. Margot A. Henriksen went so far as to claim that the atomic bomb played the “defining role” in American society between 1945 and the early 1980s. In her view, the government suppressed cultural dissent and public doubts about nuclear weapons during the 1950s, but a cultural rebirth during the 1960s forced America to come to grips with “previously disguised Cold War reality,” which she described as “immoral, insane, deadly – and ridiculous” (Henriksen, 1997, pp. 187, 318). Although other scholarly work did not substantiate Henriksen’s thesis about the centrality of the bomb in practically every aspect of postwar American culture, much of it presented a decidedly negative view of the atomic age. Paul Boyer, in a pioneering study of the cultural impact of the bomb, argued that by 1950, the public fears that immediately followed Hiroshima had been replaced by a resigned acceptance that he called the “complacency of despair” (Boyer, 1985, p. 351). He attributed this deadened cultural mood to the efforts of government officials and other opinion leaders to emphasize the future benefits of the peaceful atom, the feasibility of civil defense, and the need for supremacy in the arms race. Elaine Tyler May (1988) suggested that concern about atomic war during the 1950s played a significant role in reasserting traditional domestic responsibilities and gender roles for American women. Her findings received support from Laura McEnaney, who argued that the civil defense programs of the Truman and Eisenhower administrations not only “amplified the cacophony of voices preaching domesticity,” but also contributed heavily to the militarization of everyday life in the United States (McEnaney, 2000, p. 113). Like McEnaney, Guy Oakes traced the efforts of the US government to alert its citizens to the dangers of nuclear
war without immobilizing them with fear. He concluded that the government failed
to inform the public fully and frankly about the horrors of nuclear war, and as a result,
“the principles of liberalism were sacrificed to the exigencies of national security”
(Oakes, 1994, p. 167).

Some treatments of American postwar culture took a position that, while hardly
celebratory, assessed with greater balance the efforts of those of different persuasions
who sought to address the problems of the atomic age. Allan M. Winkler traced
popular responses to the postwar era in books, articles, songs, poems, films, television
shows, and other cultural artifacts to demonstrate the fear was an “undeniable
part of our nuclear age.” He suggested that the bomb was, “like a heart condition,”
something that people had to live with. Without fully endorsing their arguments, he
commended anti-nuclear activists for forcing governments to adopt “a more reason-
able approach to nuclear issues” (Winkler, 1993, pp. 5, 212). In a study of public
attitudes toward nuclear energy, Spencer R. Weart (1988) found that the roots of
nuclear fear went back to cultural images that predated the scientific achievement of
nuclear fission by decades. In his discussions of the postwar era, he faulted govern-
ment officials, on the one hand, and anti-nuclear activists, on the other hand, for
trying to manipulate public opinion with images that supported their own positions.
The result, he concluded, was to inhibit well-informed discussions.

Most of the scholarly literature of the 1980s and 1990s reflected American
society’s prevailing attitudes by supporting an anti-nuclear position. A few scholars,
however, without understating the horrors of nuclear war or underestimating the
risks of nuclear power, have provided more favorable perspectives on some key issues.
Their judgments, perhaps, will provide the basis for future historiographical debates.
McGeorge Bundy, who served as national security adviser to Presidents Kennedy and
Johnson and later turned to scholarly pursuits, concluded that from World War II
into the 1980s, the United States, the Soviet Union, and other nuclear powers had
been well aware of the limited value of the bomb as a military and diplomatic weapon,
keenly alert to its dangers, and firmly committed to avoiding a nuclear war. “On
balance,” he wrote, “the major lessons of this history are more encouraging than
not.” Bundy faulted American leaders (including Kennedy and Johnson) for some of
their decisions on nuclear matters, but he maintained that all postwar presidents,
including Reagan, understood that a nuclear war should never be fought and could
never be won (Bundy, 1988, p. 584).

John Lewis Gaddis supported Bundy’s evaluation of the role of nuclear weapons
in international affairs by suggesting that they had contributed in significant ways to
world stability and peace in the postwar era. Although it was apparent that nuclear
arms had not eliminated war, he argued, the demonstration of their power at
Hiroshima and Nagasaki had helped to prevent a great-power conflict on the scale of
World War II. Gaddis submitted that the invention of the bomb was such a
revolutionary development that it changed international behavior in dramatic ways.
“The fact that no great power has gone to war with another great power since 1945
is,” he wrote, “a remarkable record, unparalleled in modern history” (Gaddis, 1992,
p. 110). Gaddis’s conclusion that the existence of nuclear weapons, despite the risks
they presented, served a worthwhile purpose was self-consciously counterfactual, and
like counterfactuals on other nuclear issues, triggered strong objections from those
who disagreed.
Just as Bundy and Gaddis proposed some positive features to the history of nuclear weapons in the postwar period, there are reasons to view the history of nuclear power more favorably than it has been treated by most scholars. For example, those who wrote on the subject almost invariably quoted a 1954 speech in which AEC chairman Lewis L. Strauss declared that in the future nuclear power could provide electricity “too cheap to meter.” Scholars generally cited this statement to demonstrate the unrealistic hopes of the AEC and other nuclear proponents. But they usually failed to note that Strauss did not articulate a common view among government or industry officials, who had no illusions that nuclear power would be inexpensive. Indeed, the heavy capital costs of nuclear power were a major impediment to its development. The basis of Strauss’s flight of fancy is unclear, but it did not represent a widely held opinion or provide the rationale for AEC programs.

In a similar manner, historians frequently asserted that in preparing regulations for the protection of the public from radiation hazards, the AEC and scientific experts assumed the existence of a threshold level, below which exposure was harmless. They argued that by adopting a threshold theory, the AEC greatly underestimated the risks of low-level radiation. But the AEC and the scientific experts who made recommendations on radiation standards did not accept the threshold concept and stated explicitly that no quantity of radiation was certifiably safe. They attempted to provide an ample margin of safety by using very conservative standards; AEC regulations for emissions from nuclear plants, for example, assumed that a person stood at the boundary of a facility 24 hours a day, 365 days a year. The effects of low-level radiation are still hotly disputed by professionals in the field of radiation protection. Scholars have too often oversimplified a complex and controversial issue that is a major component in the history of nuclear energy.

Those examples raise questions about some of the shibboleths that have become conventional wisdom in the anti-nuclear consensus. They indicate that the history of nuclear power, like the political and cultural history of other nuclear subjects, still requires an abundance of careful scholarly work. They also suggest that scholars should apply the same methods of judgment and analysis to all participants in the debate over nuclear issues. Researchers should continue to view the promises and performances of government officials and business leaders with healthy skepticism, but they should hold nuclear critics to the same standards. If we are to understand the history of the atomic age (and the anti-nuclear age), scholars must provide accounts that fully recognize complexities, ambiguities, and uncertainties while avoiding the emotional and partisan approaches of the popular debate. This has occurred on vital topics such as the atomic bombings of Japan and the Cuban Missile Crisis, and we can hope that balanced, accurate, and sober scholarship will likewise enrich the study of other nuclear issues.

REFERENCES


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**FURTHER READING**

