

# The Smithsonian's National Air and Space Museum and "The Romance of Technological Progress"

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**Abstract** • The Smithsonian Institution's National Air and Space Museum (NASM) remains one of the world's most visited museums precisely because it embodies the "romance of technological progress." From its origins in the US National Museum of the early twentieth century to the opening of its first dedicated building in 1976 and beyond, visitors have flocked to the NASM to see exhibits on the wonders of aerospace technology. An attempt to depart from that narrative in the 1990s by telling the story of the atomic bombings of Japan was crushed by an organized campaign. In the aftermath, the museum reverted to its old pattern, albeit broadened to include greater diversity in the historical actors it featured. Today, as NASM rebuilds its original building, it is again striving, albeit more cautiously, to stretch the limits of its traditional mission.

**Keywords** • aviation, Enola Gay, history, museums, Smithsonian, space flight, technology

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In April 1981, the most widely read English language journal in the history of technology, *Technology and Culture*, published Michal McMahon's "The Romance of Technological Progress: A Critical Review of the National Air and Space Museum." In his article, McMahon called the museum "largely a giant advertisement for air and space technology."<sup>1</sup> He went on to critique the boosterish and uncritical tone of many of the National Air and Space Museum's (NASM's) exhibits and its avoidance of uncomfortable topics like the costs of war. Not surprisingly, McMahon's article was ignored by the NASM leadership. Since the opening of its new building on the National Mall in Washington in July 1976, NASM had been critically praised and enormously popular. It had instantly become the most visited museum on earth, with a sustained attendance of around nine million visitors per year.<sup>2</sup>

Ultimately, McMahon focused on the failure of the museum to display one particular object. This was the Boeing B-29 Superfortress Enola Gay, the aircraft that had dropped the atomic bomb on Hiroshima on 6 August 1945. McMahon ended his piece with a question, "Why not the *Enola Gay*?"<sup>3</sup> It was a question that had haunted the museum since the



early 1970s and would lead to a huge and devastating controversy over a proposed exhibition scheduled to open in 1995.

In this article, I am not analyzing McMahon's critique as such. Rather, I am using it as an entrée into a larger question. Why has NASM struggled, throughout its history, to present its often spectacular and historically important artifacts in any context other than the march of technological progress? The Enola Gay is only the most salient and difficult artifact in a collection of primarily military aerospace objects that raise uncomfortable questions about the beneficence of technological change. While most, and perhaps all, technical artifacts can be used to raise such questions, weapons systems present a particularly clear case of the negative effects of science and technology. They certainly belong to the category of the museum's collections that have been the most problematic to exhibit, particularly in cases where the exhibitions touched on the military conduct of the United States.

As a curator and historian at NASM for over thirty years and as the lead curator of the ill-fated Enola Gay exhibit, the present author cannot purport to be an objective observer of the museum's struggles with the problematic aspects of aerospace technology. This article will nevertheless seek to provide, as far as possible, a dispassionate historical account of the process by which NASM has tried to adopt a more honest and complex approach to the issue.

The problem is that, like virtually all science and technology museums, NASM is infused with a fundamental belief in the beneficent effects of technological change. This belief is one of the keys to the museum's success in attracting visitors and money. Any major treatment of the negative dimensions of aerospace technology may discomfit or even outrage the museum's core constituencies, which include the US Congress, the aerospace industry, the military services, aerospace enthusiasts, and members of aerospace organizations. Certainly, the effect of the Enola Gay affair was to inhibit NASM and many other museums from organizing substantive exhibits about military airpower over the next twenty years. Only now that the museum is in the middle of a complete overhaul and rebuilding of the National Mall Building (NMB) will those issues, and others touching on the problematic aspects of technology, be incorporated into the new exhibit plan. Even so, the situation remains sensitive. Only time will tell whether the new exhibitions, which are scheduled to open between 2022 and 2025, will succeed in taking a nuanced approach to the history of aerospace technology without exciting unwanted controversy.

## The Origins of the National Air and Space Museum

Thanks to an obscure provision in the will of the British scientist James Smithson, the United States received over half a million dollars “to found at Washington, under the name of the Smithsonian Institution, an Establishment for the increase & diffusion of knowledge among men.”<sup>4</sup> After the news of this provision arrived in 1835, the US Congress wrangled for a decade over what kind of organization it would be before passing an act in 1846 that ascribed a hodgepodge of purposes to the new establishment, which was to function simultaneously as a scientific institution, art gallery, and museum.

The Smithsonian’s first secretary, Joseph Henry, was the leading American scientist of his time. After constructing a headquarters building (colloquially known as “the Castle”), Henry decided to focus his limited funds on science. But as the Smithsonian’s collections gradually accumulated (notably with the addition of artifacts brought back from American exploring expeditions), the leadership decided, somewhat reluctantly, to take its museal function more seriously. Although in 1857 the US Attorney General designated the institution as the National Museum of the United States, it was only in 1881 that it was provided with its own building (now the Arts and Industries Building).<sup>5</sup> The Smithsonian’s accumulation of aeronautical objects began in the late nineteenth century, when the institution’s third secretary, Samuel Pierpont Langley, spearheaded a project to build a piloted, heavier-than-air airplane. The project ended in ignominious failure in 1903, just before the Wright Brothers’ historic flight on a North Carolina beach, and Langley died a broken man less than three years later.<sup>6</sup>

The first aircraft the US National Museum collected as an artifact was the Wrights’ 1909 Military Flyer. (Thanks to the Smithsonian leadership’s obtuse loyalty to Langley’s memory, the museum did not acquire the 1903 Flyer until 1948.) After the First World War, the aeronautical collections were housed in a wartime building behind the Castle, which became the Aircraft Building, and thanks to the efforts of the museum’s first (and for decades only) aviation curator, Paul Garber, the Smithsonian collected a number of important airplanes. The arrival of Charles Lindbergh’s Spirit of St. Louis in 1928, which was hung in the Arts and Industries Building, was a major event that greatly increased the museum’s popularity. But all attempts to move the federal government to create a national aviation museum foundered on the shoals of the Great Depression and the Second World War.<sup>7</sup>

It was in the aftermath of the Allied victory that Congress passed the National Air Museum Act in August 1946, thanks largely to the initiative of the Commanding General of the Army Air Forces, General Henry “Hap” Arnold. In practice, little changed on the Mall for over a decade. Garber remained the only curator and no new director was hired until

1958, after the first attempt to secure a dedicated museum building failed because of competing plans for the requested area across Independence Avenue from the Castle. In 1958, the National Air Museum (NAM) was allocated the current NMB site, between 4th and 7th Streets on the Mall, but a second attempt to obtain construction funds in the mid-1960s was thwarted by Congress's unwillingness to spend money as the Vietnam War escalated. When the Museum of History and Technology (now the National Museum of American History) opened in 1964, however, the vacated space in the Arts and Industries Building allowed NAM/NASM to expand its display space. By then, the museum had modernized all its exhibits, with fewer artifacts and more explanation, in line with changes taking place in the Smithsonian as a whole.<sup>8</sup>

Thanks to America's role in the space race, Congress legislated the addition of the word "Space" to the name of the museum in 1966. In 1967, NASM concluded an agreement with the National Aeronautics and Space Administration (NASA) that allowed the Smithsonian the right of first refusal for any historic space agency artifacts that no longer had programmatic use. But it was only in the early 1970s that the NMB was finally authorized, largely thanks to the success of the Apollo Moon landings and the efforts of Senator Barry Goldwater. It opened on 1 July 1976 as a bicentennial "present of the nation to itself."<sup>9</sup>

## **Nationalism, Progress and the Smithsonian**

Arguing for the National Air Museum before Congress in late 1945, Arnold said, "Such a permanent shrine devoted to unparalleled achievements would indeed be a fitting tribute to American aviation and its members who fought so valiantly and successfully in war and peace to give America prominence in the air."<sup>10</sup> This statement underlines the centrality of nationalism and American exceptionalism to any project to sell a national aviation museum to US politicians and the public. In Arnold's mind, America was the first and most important nation in the field of aeronautical achievement. Although Arnold's belief in US aeronautical exceptionalism rested on the fact that Americans had invented the heavier-than-air airplane, other "famous firsts," like Lindbergh's 1927 transatlantic flight in the Spirit of St. Louis, were certainly on his mind. The recent Allied victory in the Second World War, to which his Army Air Forces (soon to become the US Air Force) had been central, was also strongly implied in his statement. Arnold saw an air museum as another way to bolster his campaign for the air service's independence from the army.<sup>11</sup>

For added emphasis, Arnold sacralized the prospective museum as a "shrine," a place of pilgrimage in a secular cult of American achievement.

Arnold obviously hoped that calling the institution the National Air Museum might strengthen the case for it in Congress. But his language is fully consonant with what historian Joseph Corn has called the “winged gospel,” a fervent belief in the beneficent and liberatory character of aviation prevalent in the United States between 1910 and 1950. Arnold, whom the Wright Brothers trained as one of the first army aviators, certainly shared that belief in what Corn has called a “technological religion.” Smithsonian aviation curator Paul Garber, who had seen Orville Wright fly outside Washington in 1908, also saw the museum in those terms. Arnold and Garber were both products of the era of spectacular, record-setting flights, an era that they wanted to memorialize and enshrine in a national museum.<sup>12</sup>

Although the “winged gospel” may have begun to fade in the 1950s as flight became more routine, historian Jieun Shin notes that the Smithsonian resorted to the word “shrine” again in 1958 when arguing for the National Mall site and that the word was used on other occasions as well. Even if the word was not always used explicitly, the Wright 1903 Flyer, which was finally hung in the Arts and Industries Building in December 1948, appeared at the center of 1949, 1955, and 1964 illustrations depicting different designs for the NAM, thereby creating a central site for public pilgrimage.<sup>13</sup>

The “march of technological progress” narrative was implied in Arnold’s statement and provided the explicit structure of every proposed museum concept from the 1930s to 1976. It was manifestly obvious that powered flight had advanced astonishingly over the previous four decades, from a primitive wood-and-fabric biplane in 1903 to jet fighters and guided missiles by the time of Arnold’s testimony. Two years later, in October 1947, Major Chuck Yeager became the first person to go supersonic. After his Bell X-1 rocket plane arrived at the Smithsonian in 1950, it was inserted into an already jam-packed Aircraft Building. Human spaceflight followed just fifty-seven years after the Wrights. By fall 1961, NAM was exhibiting the Mercury capsule in which Alan Shepard had become the first American in space the previous May. Eight years later, Americans landed on the moon. In 1971, NASM placed the Apollo 11 command module *Columbia* and a test version of the lunar module in the Arts and Industries Building. With spectacular and historically important artifacts like these, it is not surprising that every conceptualization of the NMB foregrounded these “famous [American] firsts.”<sup>14</sup>

Nor is it surprising that nationalism and progress were central conceptions, given NAM/NASM’s origins in the industrial and technological exhibits of the US National Museum, which in turn was strongly influenced by the Deutsches Museum in Munich and the Science Museum in London.<sup>15</sup> In the age of powerful, rising, industrial nation-states, the narrative of nationalism and progress was the natural framework in which



**Figure 1.** This 1973 image of the Arts and Industries Building reflects NASM's emphasis on its "famous firsts." The gallery was a precursor of the Milestones of Flight Hall in the NMB and includes the Wright 1903 Flyer and 1909 Military Flyer, the Spirit of St. Louis, the Apollo 11 Command Module Columbia, the Gemini IV, Lunar Module LM-2 and other artifacts. (Photo by Richard B. Farrar, Smithsonian National Air and Space Museum (NASM 73-4622))

to think of technology and was the most likely way to get government leaders and the public to spend the money to build and sustain such museums. In its enthusiasm for technological progress, there was nothing exceptional about the National Air and Space Museum.

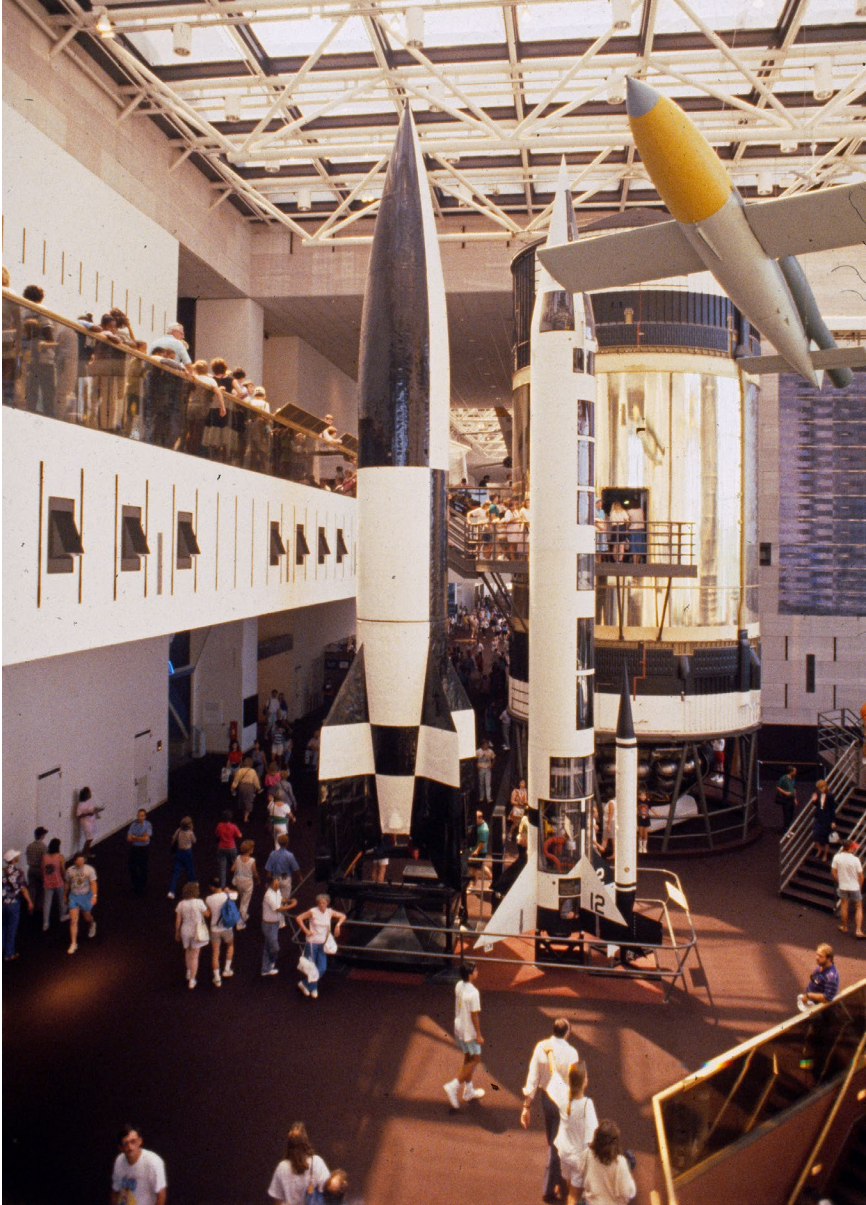
### **Ambivalence about the Military**

What NASM tiptoed around, however, was the military uses of so many of its famous artifacts. This tendency too was rooted in the culture of the Smithsonian, and in attitudes to the military in American society and government. From the American Revolution to the 1940s, the country avoided creating a large standing army that might be a threat to the citizens or government. The nation mobilized only when war was imminent

or already declared. After the Second World War, political and military leaders reasserted their desire to return to a small military establishment, but demobilization was cut short by the emerging Cold War. The Korean War and the fears of a global Soviet threat fundamentally changed American society and government and led to the entrenchment of a large and permanent military-industrial complex. Yet the reluctance to glorify the military survived in the form of a resistance to creating national military museums such as those in Europe.<sup>16</sup> This reluctance was magnified by relentless Soviet propaganda about US militarism and imperialism, which made the prospect of a military museum in the nation's capital look problematic for the United States' international image. Historian Joanne Gernstein London has described the multiple attempts to establish military museums in the Washington area, both inside and outside the Smithsonian, between 1945 and 1976. All of these plans failed. In the end, Smithsonian military artifacts and exhibits were incorporated into the Museum of History and Technology and NASM, but in ways that often subordinated their presence or subsumed them into exhibits about technology or national history.<sup>17</sup>

When Arnold first began to promote the idea of an air museum, he initially centered it on the Army Air Forces collection of Second World War aircraft of all powers, but he met resistance in Congress. By packaging NAM as a museum of technology and national accomplishment, he and his congressional supporters had more success. The same was true in subsequent building proposals. Military aircraft were included in planned displays of famous airplanes but not identified as such. There were a few unselfconscious discussions of military airpower in the earlier history of NAM, including one small exhibit about Second World War bombing in the Aircraft Building. But in the 1960s, anti-nuclear protests and the controversial use of airpower in Vietnam made the topic look dangerous. The B-29 Enola Gay became the symbol of that discomfort. During the discussions that led to the eventual approval of the NMB in 1971 and 1972, several politicians (including Goldwater, a reserve Air Force general) stated that they did not want that aircraft in the building because the Hiroshima bombing did not fit the museum's celebratory character. In any case, the downsizing of the building that took place during the early 1970s (in order to keep the museum's cost within the mid-1960s budget) made it virtually impossible to display the massive aircraft in fully assembled form.<sup>18</sup>

When the building finally opened in July 1976, there were three explicitly military galleries, *World War I*, *World War II Aviation*, and *Sea-Air Operations*. The first two largely existed because the museum had inherited multinational collections of aircraft from the two world wars, often captured as war booty. Both war galleries were dominated by single-engine fighters, which were small enough to fit comfortably in the building and



**Figure 2.** The NMB *Space Hall* obscured the Third Reich's deployment of the V-weapons for indiscriminate terror bombing by showing them in the context of an exhibit on US sounding rockets and the Skylab space station. In this photo from the late 1980s, the V-2 is the rocket at left; the V-1 "buzz bomb" is hanging overhead. (Photo courtesy of David H. DeVorkin)



raised few uncomfortable questions. Of those three galleries, only *World War II* dealt with the subject of bombing, albeit passingly, discussing the Doolittle Raid on Tokyo in 1942 and showing the nose of a B-26 medium bomber and the bombsight from the *Enola Gay*. But there was nothing on the massive destruction of cities. One of the most effective galleries was *Sea-Air Operations*, about US Navy aircraft carriers from the Second World War to the Cold War. The visitor walked into a simulated carrier hangar deck with aircraft from the Pacific and Vietnam wars. While unapologetically military in character, these three exhibits certainly presented a sanitized, technologically focused view of warfare.

In the rest of the new building, military artifacts appeared in essentially civilian contexts. Notable in this regard were the German V-2 rocket and the US Air Force Minuteman intercontinental ballistic missile, exhibited with the collection of rockets in *Space Hall*. The V-2's minimal labeling made it into a space artifact, and the Minuteman exhibit included objects from silo launch crews, but the frightening reality that the former was designed for indiscriminate terror bombing and the latter to launch nuclear warheads capable of killing millions was only implied. The two missiles were presented with early research rockets and major human spaceflight artifacts from the 1970s in a way that largely obscured the missiles' military character.

Probably the oddest example of presenting a military artifact in a civilian context was a Little Boy atomic bomb casing, like the one used on Hiroshima. It was included in an innovative gallery called *Benefits from Flight*. The exhibit focused on the social and economic spinoff effects of aerospace technology with a strong positive tilt, which made the bomb's presence even more bizarre. Faced with criticism, NASM changed the title to *Social Impact of Flight* and dismantled the gallery a few years later.<sup>19</sup>

## Rethinking the Museum's Mission

The director who planned and built the spectacularly successful NMB was Michael Collins, former Air Force test pilot and Apollo 11 astronaut. Collins was an excellent manager who accelerated the professionalization of the curatorial staff. The first PhD historians, including Tom Crouch, were hired a couple of years before the museum opened. Over the course of the 1970s and 1980s, as the older curators retired, historians came to occupy almost all the curatorial slots. The next regular director, Noel Hinnners, hired two historians of science and pushed a focus on NASA's robotic space science programs, of which he was a veteran.

Hinnners himself, however, stayed less than three years (from 1979 to 1982) before returning to NASA. He was succeeded by one of his subordinates, Walter Boyne, a former Air Force B-52 bomber pilot, whose

manipulative management style caused significant damage to morale before he was forced out in 1986. As one might expect, Boyne was unsympathetic to academic criticism and was suspicious of his mostly liberal curators, but he did not obstruct curatorial initiatives to integrate Black history and women's history into the museum's exhibits and programs. After another interregnum with an acting director from elsewhere, astrophysicist Martin Harwit of Cornell University took over the job in 1987.<sup>20</sup>

Harwit, the first regular director who was neither an aerospace practitioner nor pilot, was sympathetic to scholarship and brought a new sensibility to NASM. A lot of his attitudes to military topics can be attributed to his biography. Harwit and his parents fled Czechoslovakia in 1939 because they were Jewish, and after a sojourn in Turkey, came to the United States in 1946. Drafted into the army in 1953, Harwit was deployed as a physicist to hydrogen bomb tests in the Pacific, which gave him a visceral perspective on the dangers of nuclear weapons. Before or after arriving at the museum, he said that he liked it very much, but "I do not see anything about Dresden" (that is, the razing of the city by Allied bombers in February 1945). He accelerated the restoration of the *Enola Gay*, which had begun in the early 1980s after a visit by veterans of the 509th Composite Group, the special Army Air Forces atomic bomb unit, to the storage facility in Silver Hill, Maryland, just outside the District of Columbia. There, the veterans had seen the sadly neglected, disassembled aircraft and initiated a campaign for its restoration.<sup>21</sup>

As preparation for an exhibit, Harwit launched a series of lectures and films on strategic bombing between 1989 and 1990. Since the lecturers included such personalities as Air Force General and former Strategic Air Command chief Curtis Lemay (who had led the firebombing in Japan) and because the presentations appeared balanced to those already alarmed by the museum's turn, the series was well-attended and a success with key NASM stakeholders, such as large aerospace firms, the military services and leaders of key aerospace organizations.<sup>22</sup>

Harwit also allowed David DeVorkin, one of the historians of science hired in 1981, to develop a new, more elaborate display around the V-2. Although DeVorkin's initial interest was US space-science launches of the rocket from White Sands, New Mexico, in the late 1940s, he now began to consider its Nazi history. New information about the murderous exploitation of concentration camp prisoners had come out since 1984. That year, the Justice Department had announced that Arthur Rudolph, one of the key assistants of German American rocket engineer Wernher von Braun, had gone to Germany and renounced his citizenship rather than contest a hearing over his role in rocket production. As a fellow in the Space History Department working on von Braun, I had a role in advising DeVorkin on the Third Reich section of the mini-exhibit. DeVorkin's exhibit opened in late 1990 and drew praise from leading science journalist

Daniel Greenberg, who commented that “truth in labeling has achieved a rare breakthrough in an exhibit of military technology...where traditional practice has called for bland, antiseptic explanatory material on some of the most horrifying instruments of war.”<sup>23</sup>

One year later, NASM opened a new exhibit on the First World War, entitled *Legend, Memory and the Great War in the Air*, which contrasted the gauzy mythology of “knights of the air” with the brutal realities of aerial warfare over the trenches. This stirred discomfort in the museum’s base. An historian at the headquarters of the US Air Force History organization attacked the exhibit for making the airplanes hard to see while embedding them in an “anti-war diatribe.”<sup>24</sup> But as the First World War played and plays such a minor role in American memory, the exhibit drew little attention outside Washington.

## The Enola Gay Affair

Meanwhile, Harwit had continued to push for a way to exhibit the complete Enola Gay, but its wingspan of 43 m (142 ft) and length of 30.2 m (99 ft) left few good options. Harwit wanted a special temporary structure on the National Mall next to the museum, but the cost was high and corporate sponsorship of a controversial exhibit was unlikely. Tom Crouch, who had returned to chair the Aeronautics Department in 1989 after leaving for the American History Museum in 1985, proposed an exhibit at the Paul Garber Facility, a storage location in Silver Hill. This was unacceptable to Harwit, who wanted a blockbuster show in a prominent location. The decision about what to do was further delayed by discussions regarding the location of a proposed NASM extension building outside Washington, which would be the aircraft’s ultimate home. But that facility was not going to be funded anytime soon. After a study conducted in 1992 again demonstrated that it would be difficult to shoehorn the aircraft into the NMB, the director accepted a solution whereby only the forward and middle fuselage (about two-thirds of the aircraft’s total length) would be displayed as part of a special exhibit for the fiftieth anniversary of the bombing in August 1995.<sup>25</sup>

Two years earlier, in October 1990, I had become the curator for strategic bombing in the Aeronautics Department, a job tied to any prospective exhibition. I was hired in what was actually the third search for the position. Harwit had rejected earlier candidates because they were conventional aviation historians that he thought were unlikely to present the balanced and critical perspective he wanted. At the time I was carrying out research in preparation for a book about a very unconventional instrument of strategic bombing during the Second World War, the V-2 ballistic missile. (The book appeared as *The Rocket and the Reich* in late

1994, at the height of the *Enola Gay* affair.)<sup>26</sup> As I was a Canadian citizen at the time, Tom Crouch hired me as a Trust Fund curator, which did not require US citizenship, which was mandatory for a civil service position. My citizenship would become a subject of attack during the affair, and it probably also affected my historical approach to the atomic bombings of Japan. In hindsight, I became convinced that I was more emotionally detached from the arguments about the morality or immorality of the bombings than an American might have been, which could have contributed to a certain blindness to how controversial any US exhibit about the bombings would be if it did not start from the stance of justifying them. While American public opinion about that question was divided and complex, a large and vocal minority of veterans, conservatives, and others were absolutely convinced that using nuclear weapons were necessary to end the war and prevent an invasion of Japan. While I was previously episodically involved in exhibit discussions, the work pace suddenly accelerated in late 1992 when the director decided to go forward with the fuselage option. This occurred only two-and-a-half years prior to a mid-1995 opening, at a time when four years was NASM's norm for developing and building a major exhibition. Determined to bring survivor artifacts into the exhibit, Harwit traveled to Japan with Crouch early in 1993 to open negotiations with Hiroshima and Nagasaki, followed by Tom, myself and William Jacobs, the exhibit designer, in April. Ironically for later accusations that we were pro-Japanese, anti-American traitors, dealing with the Hiroshima Atomic Bomb Museum in particular was not easy because it had an entrenched view that the bombings were immoral and unjustified. We did secure promises from both cities to lend artifacts of the attacks anyway. In January 1994, Tom Crouch and I, assisted by museum specialists Thomas Dietz and Joanne Gernstein London, handed in the first script, which bore the longwinded academic title "The Crossroads: The End of World War II, the Atomic Bomb, and the Origins of the Cold War."<sup>27</sup> (How did we ever think that would be a good exhibit title?) Previously, Harwit, Crouch and I had a meeting with two officials of the Air Force Association (AFA), which is both a service lobby and a veterans' organization. They warned us of trouble if we continued heading in the direction we were heading by including a section about the so-called decision to drop the bomb and one that included the effects on the ground and the survivor artifacts. Harwit, who had little experience of Washington politics, did not consider the AFA to be a major threat. Tom and I felt that we were creating a balanced show with a sound academic basis, so we did not take them seriously enough either, although we always knew there would be controversy. At the meeting Harwit promised to supply them with a draft script when it came out. Upon receiving the script (which had been praised by a distinguished academic advisory board), the AFA launched an all-out attack on the NASM. An AFA news release,

followed by a long article in the magazine *Air Force*, denounced the team as “revisionist” historians with an anti-American bias. It was the beginning of a skilled and systematic public relations campaign which NASM and the Smithsonian were ill-equipped to counter.<sup>28</sup>

A detailed account of the whole affair, which has in any case been the subject of a voluminous journalistic and academic literature,<sup>29</sup> would exceed the scope of this article. Suffice it to say that it was a disaster for NASM and probably the worst museum controversy in the history of the United States. By the summer of 1994, the AFA had stirred a wave of outrage in newspapers and veterans’ organizations; soon every major news organization, except for *The New York Times*, was carrying critical or hostile coverage. Washington politicians jumped on the bandwagon of attacking NASM and the Smithsonian. Liberal Democrats, seeing no advantage in trying to protect the museum, fell silent or asked NASM to revise the exhibit, which the NASM team immediately began to do.

In January 1995, after having made multiple concessions, Harwit got into another controversy (over the number of casualties expected in an invasion of Japan) and Smithsonian secretary Michael Heyman canceled the exhibit. This decision was a relief for Tom Crouch and me. We had no desire to defend the fatally compromised product of months of negotiations with the American Legion and other veterans’ groups. A massive section on the Pacific War and Japanese atrocities had been tacked on the front end; the “decision to drop the bomb” had been edited to a shadow of itself; and the Japanese artifacts and all images of the bombs’ effects on people in Hiroshima and Nagasaki had disappeared.

Since the Enola Gay fuselage was already installed in the gallery, a substitute exhibit was thrown together quickly. Crouch and I were excluded from having anything to do with it, as we were public poison. (*Air Force* magazine had launched a smear campaign against us and Harwit, although we were lucky that most of the national media just denounced the “Smithsonian curators” without naming names.) Heyman forced Harwit to resign at the beginning of May 1995, while Tom put his job on the line to protect mine. The substitute show that opened in June focused mostly on the restoration of the airplane and the experiences of the aircrew of the 509th Composite Group, a section that had always been in the exhibit. It was the perspective many Americans preferred, that is, the view from thirty thousand feet. The bomb goes off; a mushroom cloud rises; the war ends. Notwithstanding the exhibit’s inadequacy, it stayed up for almost three years.

Harwit made fatal mistakes during the affair, most notably that of negotiating the content of the script (right down to which facts to include and exclude), something no museum should ever do. To this day, he believes that if all sides had been open-minded, it would have been possible to negotiate a reasonable script, an argument he made in his detailed and

valuable memoir, *An Exhibit Denied*. Twice in the summer of 1994, Tom Crouch recommended cancellation as it was impossible to make veterans, the historians, and the Japanese happy simultaneously. He argued that we should just display the fuselage and other artifacts from the mission and crew so the visitors could see them. He was absolutely right, but Martin Harwit refused to give up his dream, so the nightmare went on for six more months. But it must be said, if I had not been so determined to start the historical narrative only in early 1945 and exclude the course of the Pacific War as too long and complicated to fit the atomic bomb story, perhaps we would have started with a script that could have been less easily caricatured as one-sided.

The team also failed to see that academic controversies like the one over the decision to drop the bomb do not lend themselves well to exhibit treatment. (See Stephan Jaeger's article in this issue, which explores ways in which other museums have tried to address it more recently.) Such arguments are perceived by many non-academics as an excuse to criticize the atomic bombings, thereby making the United States look guilty of committing a war crime. For many Americans, just talking about whether the bombing was justified or displaying the images of burned victims questioned the rightness of the Allied cause in the Second World War, something the curators had never intended to do.

Equally unexpected was the degree to which the cycle of fiftieth anniversaries in the 1990s magnified nostalgia about, and mythification of, the United States in the Second World War. As postwar doubts and complexities faded with time and with the deaths of the war generation, the conflict came to play a growing role in US memory as the one unambiguously "good war" fought for democracy and freedom. Unlike the memory of the Vietnam War, for example, which is colored by national ambivalence about its rightness and morality, the Second World War became almost sacred. That made contemplating the atomic bombing of Japan as anything but justified even more uncomfortable.<sup>30</sup>

The Enola Gay affair clearly raises questions about public memory, the place of museums, and the history of the Second World War that go far beyond the focus of this article (which centers on the struggles faced by the NASM in dealing with the negative consequences of aerospace technology). Yet the affair began precisely in those struggles, which first made that B-29 into the symbol of why the museum needed to change, and then into a symbol of why the NASM leadership was so wrong-headed that they tried to change it. The defeat became an argument to turn back the clock to what the museum had been before: a fun place to enjoy the wonders of aerospace technology and admire the feats of inventors, pilots, and astronauts without thinking too much about negative consequences, especially in the military realm. The effects went beyond the museum; the Enola Gay affair intimidated the Smithsonian

Institution and American museums generally. For years, no one wanted to attempt controversial exhibits that might bring on a devastating public relations crisis like the one NASM had experienced.

## The Udvar-Hazy Center and the Enola Gay

The immediate aftermath of the 1994–1995 controversy forced unwelcome changes on an exhibit at the National Museum of American History, *Science in American Life*,<sup>31</sup> and provoked the cancellation of another NASM exhibit about the Vietnam War developed by Aeronautics curator Peter Jakab. When he visited Heyman, the secretary said something like, “First you want to do Enola Gay and now Vietnam?” That is unfortunate, as Peter’s carefully balanced and rather apolitical Vietnam exhibit would probably have opened if we had never attempted the other. Other consequences included an investigation of the museum’s management and a reduction of its staff and facilities. While some small departments were eliminated, those of Aeronautics and Space History were left alone as essential to the core mission. In 1996, Vice Admiral Donald Engen, who had been writing his naval aviation memoirs as NASM’s Ramsey Fellow, became the museum’s new director. He unfortunately died in a glider accident in 1999; in 2000, Marine General John “Jack” Dailey became the new director and would remain a record eighteen years. While both Engen and Dailey were better managers than Harwit, the appointment of former military pilots indicated that NASM was going back to its old ways and would attempt no controversial exhibits about aerospace technology. The issues of the atomic bombing of Japan in particular and nuclear weapons in general were viewed with alarm. In at least one case, Dailey asked for a photo showing the aftermath of the bombing of Hiroshima to be removed from an exhibit.

The museum’s dominant focus turned to the construction of the suburban extension mentioned earlier, a plan discussed soon after the NMB’s opening. The Mall building was clearly too small to display all major artifacts, and the Garber Facility’s antiquated storage buildings often had inferior conditions unsuitable for the preservation or restoration of aircraft, rockets, spacecraft, and components. Fending off political intervention and bids from other locations, NASM decided to construct the extension at Dulles International Airport in northern Virginia. Here again, the Enola Gay became central. The need for a place to properly display the complete B-29 was one of the key arguments for a new center, which would be somewhere between open storage and an elaborate version of a traditional aviation museum (that is, hangars full of planes).<sup>32</sup>

Although, like other directors before him, Harwit had deployed the Enola Gay in his attempt to find funding for the construction of the



**Figure 3.** NASM collections specialists complete the assembly of the B-29 Superfortress Enola Gay at the Udvar-Hazy Center in 2003. (Photo by Carolyn Russo, Smithsonian National Air and Space Museum (NASM 9A01586))

facility, it was only under Engen and Dailey that that campaign gained traction. Engen and Dailey had a more natural connection to the donor base of the museum, which included large aerospace corporations and the wealthy people connected to them, and their distinguished military and post-military aerospace careers (Engen had headed the Federal Aviation Administration and Dailey had been number two at NASA) gave assurance that the museum would adhere to its traditional mission of showcasing the glories of aerospace technology. The breakthrough came when Stephen F. Udvar-Hazy, a Hungarian immigrant who had made his fortune leasing airliners, committed \$60 million to the project. Dailey created urgency by setting the ambitious opening date of 17 December 2003, the centennial of the Wright Brothers' flights at Kitty Hawk. Dailey's maneuver worked and the first phase of the project, the Boeing Aviation Hangar, opened on 15 December.<sup>33</sup>

At the center of the hangar, elevated on jacks so that visitors could peer into the cockpit from an elevated walkway, stood the gleaming, completely restored Enola Gay. Like all artifacts in the Udvar-Hazy Center, the plane was accompanied by a single descriptive label, which provided a series of dry facts and identified the artifact as the airplane that dropped the atomic bomb on Hiroshima. On opening day, there was



a small peace protest under the aircraft and an unrelated person tried to throw a container of red paint at the nose of the airplane but missed. There have been no protests since. Immediately after the opening there was also a brief, ultimately futile exchange between Jack Dailey and Peter Kuznick, an historian at American University in Washington, over the question of whether a second label should be provided that would discuss the context and casualties of the bombing.<sup>34</sup>

Although the *Enola Gay* clearly deserves a rich contextualization, the affair's message was that while any NASM exhibit must necessarily defend the bombing of Hiroshima and Nagasaki, such a position would draw protest. To this day, NASM's only viable option appears to be the fallback position suggested by Tom Crouch in 1994: to simply exhibit the aircraft and let visitors bring their own interpretations.

## Conclusions

The history of NASM and its engagement with the *Enola Gay* demonstrate that, at least so far, it is difficult to present anything but a positive message of technological change and US achievement in aerospace technologies. This has deep roots in museum history. Beginning in the late nineteenth century, the Smithsonian (like its counterparts, the Science Museum London and the Deutsches Museum in Munich) collected icons of national industrial, technological, and scientific achievement. Artifacts were exhibited with technological progress as the implied or explicit context, even when longer narrative labels were absent. This tradition continued when airplanes were added after 1910. Paul Garber and other early architects of the NAM were also shaped by a discomfort (in America in general and at the Smithsonian in particular) with a too explicit glorification of the military on the National Mall and by the spectacular successes of aviation in the first decades of the twentieth century, which inspired a quasi-religious belief in the beneficence of aerospace technologies. Even as the "winged gospel" began to fade, the new triumphs of space exploration confirmed the march of aerospace progress. Any discussion of the negative effects of technology (especially the destructive potential of aerospace weapons) not only conflicted with that message but also would generate discomfort among museum stakeholders and donors in the military, aerospace industry and Congress. It is thus unsurprising that nothing of the sort happened until the arrival of Martin Harwit, who had an agenda to change the museum.

After the *Enola Gay* affair, NASM remained a highly successful and beloved institution, in no small part because it reverted to what it had always been for visitors; namely, a place to view spectacular aerospace artifacts in an optimistic, implicitly patriotic context. The museum did

open complex and informative exhibits about aerospace science and technology (such as *Space Race*, *Explore the Universe* and *Pioneers of Flight*), which were successful precisely because they focused on positive stories of technoscientific innovation in primarily civilian fields. (Although *Space Race*, which opened in 1997, acknowledged the central role of the nuclear arms race in the origins of the space race.)

Although its curators have embedded more sophisticated historical analysis in new exhibits, NASM remains successful precisely because it still embodies the "romance of technological progress," albeit now incorporating stories that embrace diversity in gender and race. This broadened version of the traditional message is what visitors, donors, and politicians want to hear because it reflects contemporary, mainstream American values about women and minorities while bringing those groups into the fold as pioneers of science and technology who are still almost universally admired for their contributions to the improvement of the nation and humanity.

Currently, the museum is in the midst of a \$900 million project to rebuild the entire aging NMB, which has necessitated either the total overhaul or complete replacement of every single exhibit. These new exhibitions, which will open in stages between 2022 and 2025, include some that will carefully push the boundaries of what NASM has traditionally done. Three military galleries (*World War I*, *World War II in the Air*, and *Modern Military Aviation*) will address the cost of war, strategic bombing, and nuclear weapons and an *Innovations* hall will house rotating exhibits, beginning with one focusing on climate change. It will be fascinating to see whether the National Air and Space Museum will finally be able to move, however modestly, beyond the romance with science and technology that has defined it from the outset.

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## Notes

1. Michal McMahon, "The Romance of Technological Progress: A Critical Review of the National Air and Space Museum," *Technology and Culture* 22 (1981), 281–296, here 281.
2. Ted Maxwell and Tom D. Crouch, "The World's Most Popular Museum," in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 260–316, esp. 270–276.
3. McMahon, "Romance of Technological Progress," 296.

4. "The Will of James Smithsonian," accessed 29 January 2021, <https://www.sil.si.edu/Exhibitions/Smithson-to-Smithsonian/will.htm>; Heather Ewing, *The Lost World of James Smithsonian: Science, Revolution and the Birth of the Smithsonian* (New York: Bloomsbury, 2007).
5. "Smithsonian Timeline," accessed 31 January 2021, <https://siarchives.si.edu/history/smithsonian-timeline>; Pamela M. Henson, "'Objects of Curious Research': The History of Science and Technology at the Smithsonian," *Isis* 90 (1999), Supplement: *Catching up with the Vision: Essays on the Occasion of the 75th Anniversary of the Founding of the History of Science Society*, S249–S269, here S250–S254.
6. Tom D. Crouch, "Flight and the Smithsonian" and "Capable of Flight? The Wright-Smithsonian Controversy," in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 18–101.
7. F. Robert van der Linden, "Building a Collection," in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 102–174; Jieun Shin, "Displaying Cold War Technology: The National Air and Space Museum, 1946–1976" (PhD diss., University of Minnesota, 2018), 20–30.
8. Shin, "Displaying Cold War Technology," 30–149; Joanne M. Gernstein London, "A Modest Show of Arms: Exhibiting the Armed Forces and the Smithsonian Institution, 1945–1976" (PhD diss., George Washington University, 2000), 92–104, 199–222; Dominick A. Pisano, "The Long Road to a New Museum," in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 180–204; Robert C. Post and Arthur P. Molella, "The Call of Stories at the Smithsonian Institution: History of Technology and Science in Crisis," *Icon* 3 (1997), 44–82, esp. 45–46, 48–51.
9. Allan A. Needell, "National and International Expositions and the Origins of the National Apollo 11 Artifacts Collection," in *Behind the Exhibit: Displaying Science and Technology at World's Fairs and Museums in the Twentieth Century*, ed. Elena Canadelli, Marco Beretta, and Laura Ronzon (Washington, DC: Smithsonian Institution Scholarly Press, 2019), 203–220, esp. 203–213, accessed 4 February 2021, <https://scholarlypress.si.edu/store/museum-studies-art/behind-exhibit-displaying-science-and-technology-w/>; Michael J. Neufeld, "The NASA-NASM Partnership," in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 252–259; Shin, "Displaying Cold War Technology," 149–256; Gernstein London, "A Modest Show of Arms," 222–258; Pisano, "The Long Road," 204–248.
10. Testimony of Henry Arnold, 9 November 1945, quoted in Shin, "Displaying Cold War Technology," 34.
11. *Ibid.*, 25–30. On Arnold, the Army Air Forces and their focus on strategic bombing as a means to winning wars and becoming an independent service, see Dik Alan Daso, *Hap Arnold and the Evolution of American Airpower* (Washington, DC: Smithsonian Institution Press, 2000), and Michael S. Sherry, *The Rise of American Air Power: The Creation of Armageddon* (New Haven: Yale University Press, 1987).

12. Joseph J. Corn, *The Winged Gospel: America's Romance with Aviation, 1900–1950* (New York: Oxford University Press, 1981), esp. 135–140. For a discussion of the effect of aviation achievements on elite and popular culture in the interwar years and after, see Robert Wohl, *Spectacle of Flight: Aviation and the Western Imagination, 1920–1950* (New Haven and London: Yale University Press, 2005) and *A Passion for Wings: Aviation and the Western Imagination, 1908–1918* (New Haven: Yale University Press, 1994).
13. Shin, "Displaying Cold War Technology," 46–76.
14. *Ibid.*, 55–56, 60, 98–100, 134–136, 162, 216, 257–258; Pisano, "The Long Road," 194, 196, 204–209, 226–231; Needell, "National and International Expositions," 214–218. Shin notes that although in the 1960s, the then director, under pressure from the secretary of the Smithsonian to provide an anthropological context for NASM exhibits, denounced the "fetish of the famous firsts," his exhibit concepts were still driven by progress rhetoric (Shin, "Displaying Cold War Technology," 124–130). In the 1970s, NASM reverted to its earlier pattern, as shown by the Milestones of Flight Hall in the center of the new building.
15. Henson, "'Objects of Curious Research,'" S260, S262; Bernard Finn, "Der Einfluss des Deutschen Museums auf die internationale Landschaft der Wissenschafts- und Technikmuseen," in *Geschichte des deutschen Museums: Akteure, Artefakte, Ausstellungen* [History of the German museum: Actors, artifacts, exhibits], ed. Wilhelm Füssl and Helmuth Trischler (Munich: Prestel, 2003), 397–405; Peter J. T. Morris, ed., *Science for the Nation: Perspectives on the History of the Science Museum* (London: Palgrave Macmillan/Science Museum, 2010). For more on the evolution of National Museum technology and industry exhibits into the Museum of History and Technology/National Museum of American History and the NAM/NASM, see Robert C. Post, *Who Owns America's Past? The Smithsonian and the Problem of History* (Baltimore: Johns Hopkins University Press, 2013).
16. London, "A Modest Show of Arms," 13–17, 158–162, 259–269.
17. *Ibid.* London's dissertation describes the failure of the attempt to bring the Second World War aircraft carrier *USS Enterprise* to Washington and the abortive attempts to establish other military museums, most notably a Smithsonian-run National Armed Forces Museum, a project that finally died in the 1970s. She also discusses the ambivalent relationship of the Museum of History and Technology (now the National Museum of American History) and the NAM/NASM with the military artifacts in their collections and with the proposed armed forces museum.
18. *Ibid.*, 92–104, 201–216, 246–256; Shin, "Displaying Cold War Technology," 224–226; Dik A. Daso and Tom D. Crouch, "The Smithsonian and the *Enola Gay*," in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 318–324.
19. Shin, "Displaying Cold War Technology," 238–246; London, "A Modest Show of Arms," 256–257; David H. DeVorkin and Michael J. Neufeld, "Space Artifact or Nazi Weapon? Displaying the Smithsonian's V-2 Missile, 1976–2011," *Endeavour* 35 (2011): 187–195, doi:10.1016/j.endeavour.2011.08.003.

20. Pisano, "The Long Road," 226–248; Maxwell and Crouch, "The World's Most Popular Museum," 268–288; Martin Harwit, *An Exhibit Denied: Lobbying the History of Enola Gay* (New York: Copernicus, 1996), 26–28.
21. Harwit, *An Exhibit Denied*, 1–2; Edward T. Linenthal, "Anatomy of a Controversy," in *History Wars: The Enola Gay and other Battles for the American Past*, ed. Edward T. Linenthal and Tom Engelhardt (New York: Metropolitan Books, 1996), 9–62 (on Harwit's biography, 14–15). Lienthal's work is the most historically accurate short account of the *Enola Gay* affair, in which Lienthal himself participated as a scholarly advisor to the exhibit. For more on the *Enola Gay* affair, see Michael J. Hogan's "The *Enola Gay* Controversy: History, Memory, and the Politics of Presentation," in *Hiroshima in History and Memory*, ed. M. Hogan (Cambridge: Cambridge University Press, 1996), 200–232.
22. Harwit, *An Exhibit Denied*, 68–70. The change in the museum's approach was noted by the editors of the journal *Technology and Culture*, who responded by publishing what amounted to a sequel to McMahon's "Romance of Technological Progress." Samuel A. Batzli, "From Heroes to Hiroshima: The National Air and Space Museum Adjusts its Point of View," *Technology and Culture* 31 (1990): 830–837.
23. Daniel S. Greenberg, "Nazi V-2 Gets Realistic Relabeling at Smithsonian," *Science & Government Report* (December 1990), 5; DeVorkin and Neufeld, "Space Artifact or Nazi Weapon?" 191–193.
24. Tom D. Crouch, "Hey Marge, Are We Still at Air and Space?" in *Over the Front* 7 (1992), 101–104, and Stephen Miller, "Gloom and Doom at NASM," *Over the Front* 7 (1992), 104–108, Miller quote on 108.
25. Harwit, *An Exhibit Denied*, 26–122.
26. *The Rocket and the Reich: Peenemünde and the Coming of the Ballistic Missile Era* (New York: The Free Press, 1995).
27. Harwit, *An Exhibit Denied*, 150–217; Linenthal, "Anatomy," 28–32. Harwit misses our follow-up trip to Japan, but details many, often difficult stages of exhibit concept development in 1993 that I had entirely forgotten. The first script was published as a result of the ensuing controversy as Philip Nobile, ed., *Judgment at the Smithsonian* (New York: Marlowe & Company, 1995), 1–126.
28. Harwit, *An Exhibit Denied*, 207–260; Linenthal, "Anatomy of a Controversy," 33–42. AFA's campaign archive can be found at <http://secure.afa.org/media/enolagay/default.asp>, accessed 21 February 2021.
29. In addition to the sources previously cited, see "History and the Public, What Can We Handle?" in *The Journal of American History* 82 (1995–1996): 1029–1144; Robert J. Lifton and Greg Mitchell, *Hiroshima in America: Fifty Years of Denial* (New York: Grosset/Putnam, 1995), 276–297; Kai Bird and Lawrence Lifschultz, eds., *Hiroshima's Shadow: Writings on the Denial of History and the Smithsonian Controversy* (Stony Creek: Pamphleteer's Press, 1998), 317–409; Post, *Who Owns America's Past?*, 197–220; Robert C. Post, "A Narrative for Our Time: The *Enola Gay*," *Technology and Culture* 45 (2004): 373–395; Tony Capaccio and Uday Mohan, "Missing the Target: How the Media Mishandled the *Enola Gay* Controversy," *American Journalism Review* 176 (July/August 1995): 18–26; and Mike Wallace, "The Battle of the *Enola Gay*,"

- in *Mickey Mouse History and Other Essays on American Memory* (Philadelphia: Temple UP, 1996), 268–318. For a comprehensive bibliography of the controversy as of 2006, compiled for a Lehigh University course, see “Books and Articles on the Enola Gay Controversy,” accessed 21 February 2021, <http://digital.lib.lehigh.edu/trial/enola/resources/>. For a recent analysis, see James M. Banner, Jr., *The Ever-Changing Past: Why All History is Revisionist History* (New Haven: Yale University Press, 2021), 209–230.
30. When Studs Terkel published his popular collection, *“The Good War”*: *An Oral History of World War Two* (New York: Pantheon, 1984), he intended his title to be read ironically; yet it captured American attitudes, at least regarding the rightness of the cause. The bigger wave of mythification of the war came mostly after, and perhaps partly in response to, the *Enola Gay* affair. See Tom Brokaw, *The Greatest Generation* (New York: Random House, 1998). Brokaw’s lionization of the Great Depression/Second World War generation of Americans continues to influence the public and the media and has, in turn, provoked a critique by American historians. See Michael C.C. Adams, *The Best War Ever: America and World War II* (2nd edition; Baltimore: Johns Hopkins, 2010), xi–xii, 130–147; John Bodnar, *The “Good War” in American Memory* (Baltimore: Johns Hopkins, 2010), 200–217; and Kenneth D. Rose, *Myth and the Greatest Generation: A Social History of Americans in World War II*, 1–7. For an analysis of the contrasting attitudes to the Vietnam War, see Robin Wagner-Pacifici and Barry Schwartz, “The Vietnam Veterans Memorial: Commemorating a Difficult Past,” *American Journal of Sociology* 97 (1991): 376–420.
  31. Post and Molella, “Call of Stories,” 44–45, 55–74; Arthur Molella and Carlene Stephens, “Science and its Stakeholders: The Making of ‘Science in American Life’,” in *Exploring Science in Museums*, ed. Susan Pearce (London: Athlone Press, 1996), 95–106.
  32. Daso and Crouch, “The Smithsonian and the *Enola Gay*”; Dik A. Daso, “The National Air and Space Museum Spreads Its Wings,” in *Smithsonian National Air and Space Museum: An Autobiography*, ed. Michael J. Neufeld and Alex M. Spencer (Washington, DC: National Geographic, 2010), 318–347; Harwit, *An Exhibit Denied*, 22–25, 111–125.
  33. Daso, “The National Air and Space Museum,” 347–362.
  34. *Ibid.*, 362–365; Emily A. Margolis, “Atomic Deliveryman on Display: The *Enola Gay* at the National Air and Space Museum’s Steven F. Udvar-Hazy Center,” M.A. thesis, University of Oklahoma, 2013, courtesy Emily Margolis; Post, “A Narrative for Our Time,” 381–386.