11 The Diffusion of an Atomic Icon

Nuclear Hegemony and Cultural Memory Loss

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In America, visual imagery related to the "Atomic Age" stands ready for recall as a style, easily appropriated into retro-fashion and nostalgia. But Americans with access to the Atomic Age as style don't necessarily stand ready to recall the era's inaugural event—that of the bombings of Hiroshima and Nagasaki. Thus, within Atomic Age aesthetics, understood as the performance of collective memory, there exists a gap. This chapter considers how that gap might not be so much the product of a collective mental block, but the extension of the structure of the Atomic Age archive as it was built in the Cold War. For the horrible imagery of nuclear destruction was not so much forgotten as it was *lost*, and it was lost as it was managed, even displaced, by competing iconography.

To tell this story we begin where any critical visit to a museum or archive typically begins, with a look at taxonomy. Buried within the U.S. Psychological Strategy Board's 1952 archive sits a two-page catalog of "Photo Branch material for psychological [propagandistic] use," which begins:

> 52–1818P—USN's [Navy's] new F9F-6 "Cougar" jet plane that flys [*sic*] more than 600 mph.
>
> 52–1827P—USAAF's C-124 "Globe Master" cargo airplane takes in AF H-19 helicopter into its belly.
>
> 52–1399P—USN displays its newest carrier-based bomber, the XA2J-1.
>
> 52–1459P—One man helicopter, developed by USN.
>
> 51–17498P—Three French agriculturists study plant disease & insect control in U.S.
>
> 51–17479P—Four French agricultural economists studying in U.S.
>
> 52–1458P—Two technicians at U.S. Atomic Energy Commissions plant in Oak Ridge, Tennessee.[1]

We stop here and make two notes: first, the photo of nuclear technicians was filed alongside those of U.S. air power and agricultural technology, swords

and plowshares. Second, the nuclear technicians here are pictured *at Oak Ridge*, squarely allying them with the regime of swords *over* plowshares.

From 1945–1962 some 220,000 personnel were involved in atmospheric nuclear weapons testing alone, and many more contributed to the engineering, construction, storage, protection, and readiness efforts of America's nuclear arsenal.[2] The majority of these personnel were nuclear technicians: engineers, mechanics, pilots, and other kinds of operators of machines. Together, they formed the backbone of American nuclear production, linking science to engineering, theory to application, and design to practice, as well as civilian life to the defense establishment, private enterprise to public service, civil society to the state, and peace to war. For much of the early Cold War, as the Psychological Strategy Board's files suggest, nuclear technicians were canonical icons of American nuclear hegemony, integral to the complex process by which American nuclear power was symbolically sustained and regularly recreated. In as much as American power rested firmly on a claim to technological superiority over the Soviet world, America's nuclear elite rested the claim to both nuclear legitimacy and hegemony on technical mastery. The icon of the expert technical operator visibly reinforced, and indeed performed, this claim. It is thus no coincidence that parallel to America's rise to nuclear power, images of technical experts proliferated throughout mass culture.

Despite the ubiquity of the image of the expert operator in even contemporary iconography, its origins and significance in nuclear production have faded from public memory. It exists as a sign without a referent. Visible yet vacant, contemporary representations of the technical expert at his console, which so dominated early nuclear iconography, now tend toward camp or anachronism. Like monuments to a forgotten war, these mute representations obscure a highly effective program of myth construction. The *origins* of nuclear hegemony have faded from view, hence granting it a quality of permanence, intransigence, even timelessness. We thus truly *suffer* from cultural memory loss.

Those who benefit from American nuclear hegemony might feel understandably ambivalent about the historic violence that produced such a power. If forgetting keeps us subject to the Bomb, it also protects us from its implications. The very iconography that enabled this process of forgetting can also serve in the recovery of collective memory and shared ethical responsibility.

In this essay we give a critical-historical account of a process of cultural memory loss. We trace the course of the icon of the nuclear technician into mass culture's practices and artifacts, arguing that the symbolic power of the nuclear technician in the early Cold War lead to a diffusion, in the sense of widespread use, and thus to a defusing, in the sense of symbolic integration into the mundane. Like the archive of its cataloging, the icon of the nuclear technician came to be buried, so to speak, within the artifacts and practices of mass culture, effectively rendering the nuclear technician as such invisible, and thus largely forgotten—remembered only as it pops

up as an anachronism within popular culture, or, as we will discuss in our conclusion, as a suddenly scarce national resource within the nation's defense apparatus.

This history of the diffusion of an icon, we argue, allows us to follow the complex course of the creation, re-creation, and transformation of nuclear hegemony in the U.S. We argue that the diffusion of the icon of the nuclear technician—condensed into the image of an *operator*—eventually encompassed Americans *en masse*, rendering everyone an operator, and the (nuclear) operator a kind of ideal American citizen. This, in turn, eventually transformed the nature of nuclear hegemony in the U.S. from the province of the sublime to that of the mundane.

The first section of our essay, therefore, recounts the state-sponsored visual practice of foregrounding the nuclear technician, with emphasis on the rhetorical functions of this state-created icon with respect to nuclear hegemony. The second section, in turn, looks at the diffusion of the operator in American mass culture, arguing (1) that it is a relic of the nuclear technician, and (2) that it represents the defusing of nuclear hegemony in America from the sublime into the mundane.

Our study would thus make both historical and theoretical contributions to the study of visual practices and practices of memory. Here, we are interested in the *history of an icon* over several decades in the second half of the twentieth century, with special emphasis on the pivotal decade of the 1950s. Like histories of ideas and concepts, our history is guided by particular interests, in our case the relationship of the icon of the nuclear operator to the creation, recreation, and eventual transformation of nuclear hegemony in the U.S. We hope that the particular history we offer here might contribute to other nuclear histories, as well as function for visual studies as one significant example of a history of an icon. Theoretically, we explore the link among aesthetics, memory, and the processes of political hegemony, for the history we offer here gives us insight into one means by which political hegemony, in the words of Raymond Williams, "has continually to be renewed, recreated, defended, and modified."[3] Hegemony has to be formed, reformed, and transformed, and thus includes an aesthetic aspect concerned with what, how, and when a people see an object, idea, and/or concept. We suggest that the transformation of nuclear hegemony in America in the second half of the twentieth century entailed a process of forgetting that was also a process of converting the sublime into the mundane. Thus, we explore the political implications of the aesthetics of memory.

NUCLEAR HEGEMONY AND THE NUCLEAR OPERATOR

Since Hiroshima and Nagasaki, the most spectacular of the nuclear icons has been the image of the mushroom cloud, "the godhead of Annihilation and Ruin."[4] There have been, to be sure, other nuclear icons: bomber airplanes,

ICBMs, and chubby bombs. And then there have been iconic personalities: nuclear scientists, military brass, and presidents. But the mushroom cloud completed each of these signs, and has perdured as the central nuclear icon. At once apocalyptic and admonitory, the image of debris billowing up into a giant white "T" has gained in the modern world the significance of both an augury, forewarning a future fate, and the injunction "Never again."

In fact, this is but one of several dualisms endemic to the iconicity of the mushroom cloud, making it a powerfully polyvalent sign. It is at once an object of "experiment," a product of the development of modern natural sciences, and "experience," a product of the collective imaginary, an object of fantasy, fetish, and futuristic narratives. And within the former, it is at once the apogee of the scientific project, the unlocking of a key to the universe, and the ultimate undoing of that project, unleashing the universe's power in an uncontrollable manner. Similarly, within the world of experience (or "aesthetics"), the image of the mushroom cloud is the consummate sublime object—invoking fear and awe, tropes of magnitude and terror, and doing a kind of violence to the imagination—and, as David Nye has argued, "A technology so terrifying [that it] ceased to seem sublime," and became simply horrifying.[5]

These dualisms have presented serious obstacles to nuclear hegemony. By "nuclear hegemony" we mean the ongoing processes by which political, social, and cultural forces combine to establish and enforce the dominant power of the nuclear-industrial complex, which since the Manhattan Project in the 1940s has had power to command resources, protect secrets, control publicity, and establish professional and political classes and hierarchies of personal and institutional authority. What Raymond Williams writes of "lived hegemony" more broadly we appeal to in conceiving of nuclear hegemony:

> A lived hegemony is always a process. It is not, except analytically, a system or a structure. It is a realized complex of experiences, relationships, and activities, with specific and changing pressures and limits. In practice, that is, hegemony can never be singular. Its internal structures are highly complex, as can readily be seen in any concrete analysis. Moreover (and this is crucial, reminding us of the necessary thrust of the concept), it does not just passively exist as a form of dominance. It has continually to be renewed, recreated, defended, and modified. It is also continually resisted.[6]

Thus hegemony rests on a dynamic "claim to," rather than being the "possession of" the ruling class. Hegemony can never be the "possession of" because it is not total or undivided. It must regularly work to control counter- and alternate-hegemonic forces.[7]

In the case of nuclear hegemony, the "claim to"—as Andrew Feenberg has argued more generally regarding the elites of modern industrial

civilization—has been a claim to "technical mastery."[8] Indeed, precisely because the mushroom cloud, the central icon of nuclear power (both in the natural and political sense of "power"), is so volatile, unstable, and polyvalent, *mastery* has been a particularly vital claim to establish and re-establish within the processes of nuclear hegemony. Yet, within its actual evolution, readily available representatives of mastery in American culture have been notably ineffective in sustaining this claim. Theoretical scientists, whose mastery of the "natural" world would seem to solidify a claim to technical mastery, have in fact been repeatedly rendered in public and popular culture alike as potentially "mad," either because they are maniacally obsessed with the power they posses, or because they posses a form of intelligence "out of touch" with "society" (e.g. Jerry Lewis's *Nutty Professor*). Similarly, military men (indeed, they've been *men*), have been portrayed as consumed with destructive power of their nuclear arsenals, ready to sacrifice all life, including their own, in their martial quest (e.g. Air Force General Jack Ripper in *Dr. Strangelove*, or Colonel Cascio in *Fail-Safe*). Even presidents have been rendered weak-kneed, reckless, ill-informed, or as tools of a manipulative conspiracy (again, most notably in *Dr. Strangelove*).

On the other hand, nuclear technicians—at least until the accident at Three Mile Island, and we would argue still after—have been remarkably reliable icons of technical mastery within the hegemonic discourses of nuclear power. By "technicians," we mean those positioned as immediately responsible for the instrumental operation of nuclear power. They include what typically falls under the category "technician" (persons charged with the care and operation of instruments in industrial and/or experimental settings) but also may include engineers, pilots, mechanics, programmers, electricians, etc. All are, in essence, *operators*, charged with the disciplined performance of instrumental feats. Therefore, unlike theoretical scientists, military brass, or politicians, the nuclear technician has enjoyed a unique claim to "technical mastery," one evinced in a myriad of ways in the represented and actual performance of instrumental control over nuclear technologies. In the next section, we explore in some detail the iconicity of the nuclear technician by looking at a number of instances of visual media concerned with the claim to technical mastery vis-à-vis nuclear power: the U.S. government's *Operation Ivy* (1953), Columbia Picture's *Fail-Safe* (1964), Looney Tunes' *Crockett Doodle-Doo* (1960), the U.S. government's atomic energy exhibit in Geneva (August 8–20, 1955), and Frederick Wiseman's *Missile* (1987). Our argument is that the iconic reliability of the nuclear technician resides in the convergence, within his (and even *her*) figure, of three fundamental associations within twentieth century American industrial society: the association of "rationality" with instrumental control, the association of the "model American" with a science-and-technology savvy middle class, and the association of mass military enlistment with mass consumer technologies.

"Men are responsible"

In the fall of 1952 the U.S. tested two nuclear devices in the so-called Pacific Proving Grounds in the Marshall Islands. Detonated from Eniwetok Atoll, the tests were designed to gauge the operability of a hydrogen bomb, and marked the rapid acceleration of the nuclear arms race. Indeed, atomic tests had by 1952 become critical elements in America's "psychological war" with the Soviet Union, intended as much to prove America's nuclear superiority over its adversary as to scientifically test new atomic technologies.

However, Operation Ivy—the codename given to the tests—presented immediate publicity problems for the U.S. government. While the events and images of the operation were tightly guarded, some letters from observers were apparently leaked to the news media, which in turn prompted official statements from the Atomic Energy Commission. To the chagrin of the government, news media relayed the contents of the AEC statements with visuals from Hiroshima and Nagasaki, as well as stock photos from the Pacific Proving Grounds. As Colonel Byron Enyart of the Air Force wrote Truman's Psychological Strategy Board but two days after the completion of the tests, "Along with every statement, the commentators or the television newscasters showed pictures of Hiroshima and Nagasaki, as well as atomic artillery being displayed in our proving grounds, with speeches by Pace and General Officers, showing what great potential war capabilities we have." Such a repertoire of words and images, he warned, "affects the war nerves of Western Europe, and for that matter, the entire world, which in turn makes possible the continued effective use of peace as a leading theme in Soviet psychological operations." To its own detriment, the U.S., Enyart suggested, had not yet dissociated its nuclear testing from warmongering.

Enyart consequently urged the PSB to heed the advice of Dr. Stefan T. Possony, who in an October 1952 government study concluded, "In the field of psychological warfare, too, the atomic bomb is being used effectively against the U.S. Our enemies contend that reliance on this 'weapon of mass destruction' reveals the 'barbarous' character of American 'imperialism.'" Possony thus recommended that, in order to gain the mantel of "peace" in the world, the U.S. government begin to aggressively pursue a non-military "international atomic program" that could in promise if not in deed achieve the "acceleration of industrialization in countries with small investment capacity," "the provision of electric power on a quid-pro-quo basis to countries exporting vital raw materials and fearing depletion and exploitation," "the acquisition of a capability to cultivate large areas of the jungle and steep slopes through cheap power," "the irrigation of large desert areas," the "enlargement of the transportation potential of the world," the "political integration or federation of national states," and the "restructuring of industrial societies."[9]

In this way, Possony's report linked the effective application and operation of atomic energy to technical revolution in industrial society, and indeed to a restructuring of the world order. At the heart of Possony's proposal

was the material and "psychological" power of instrumental rationality, which could harness, he asserted, the seemingly infinite potential of atomic energy. Indeed, later—this time advising the Eisenhower administration in the winter of 1954—Possony would stress the iconicity of instrumental control in the Cold War psychological battle for the mantel of peace. Having looked at secret footage of the 1953 Operation Castle tests only to determine there was "no way to produce a movie of the operation in which the hydrogen weapon can be minimized or ignored," he advised

> that the film (about Operation Castle, which would be released on a limited basis later that year) highlight the scientific, systematic and typically American way by which we have been going about developing nuclear energy. We should show the effort involved, our regard for human lives, and the various construction, logistical and technological activities, in order to drive home the idea that American technology can accomplish many gigantic undertakings efficiently. In this particular case, the audience should be convinced that such a problem is "right up our alley" and can be handled without strain.[10]

Operation Castle, in other words, could be presented as an effortless operation, the epitome not of technology spiraling out of control, but of the "rationality" of instrumental control.

To be sure, even in framing atomic tests as "operations"—borrowed from military parlance—elites embedded what were in fact highly experimental and unpredictable scientific and technological ventures within the values of instrumental rationality: success would be tied to technical mastery, and technical mastery could be asserted and reasserted as long as it could be shown that technical instruments did their job monitoring and measuring the tests.

It was precisely such an approach that the U.S. government's *Operation Ivy* took in the 1950s. Importantly, the film—produced by the Air Force's Lookout Mountain Studios in Hollywood to cover the detonation of the "Mike" device—was created *both* for government officials and for the general public (with different cuts of the film for the different audiences), and the discourse of technical mastery vis-à-vis instrumental rationality pervaded both versions. Therefore, the emphasis on technical mastery was not strictly a matter of "audience adaptation" or "pulling one over." Rather, it represented the articulation of an ideology that helped sustain—in the face of both the escalation of the arms race and the mounting challenges of containing the circulation and fallout (literal and metaphorical) of weaponized nuclear energy—the illusions of instrumental rationality with regard to the competent control of machines.

After a short introduction from a government official, *Operation Ivy* (in both versions) begins with a guided tour of the testing complex at and around Eniwetok Atoll, lead by Reed Hadley, a Hollywood movie actor, primarily known in the early 1950s for Westerns. Hadley stands on the *U.S.S.*

Estes, the vessel carrying the lead scientists and engineers overseeing the test. Walking into the ship's control room, he introduces viewers to Stan Burress, Commander of the Scientific Task Group. Burress, in turn, turns to panels of instrumentation and begins to explain their role: "If you'll look close you'll see that it is now 59 minutes before HR. As time clicks off, more and more lights come into operation. This kind of display panel is new to atomic test work because of the large number of remote control and metering problems encountered in this operation." The panels of instrumentation repeatedly return to view in the film: viewers see numerous shots of timing and metering devices, as well as cameras, antennas, receivers, and monitors. Such technologies, viewers are told, ensure the thorough monitoring of the tests. Cameras in particular are foregrounded as reliable instruments of measurement and monitoring. As Burress explains, "The lens of a television camera rather than human eyes is watching events." Nothing, it appears, can escape the "eye" of this network of monitoring and measuring devices—not even, as the film puts it, "one the most momentous events in the history of science. . . . [T]he most powerful explosion ever witnessed by human eyes." Instrumentation thus assures the rational appraisal of the sublime.

Yet, it is not the instruments per se which assert the power of instrumental rationality over this world-historical explosion. It is the bodies before the instruments, the engineers and technicians who establish and assure their proper functioning, who manipulate their controls, who interpret their signals, and who display, in their operational agility, technical mastery.

Figure 11.1 The operator at his console in *Operation Ivy*.

In fact, instruments without operators, control panels without pilots, or gauges without interpreters would only heighten the anxieties of technology run amok. Within a world of nuclear hegemony, it is thus the iconic figure of the nuclear technician that assuages these anxieties, and assures audiences. Indeed, *Operation Ivy* squarely addresses the "gamble" of nuclear testing by pointing, literally, to the personage of the nuclear technician. Upon the deck of the *U.S.S. Estes* Los Alamos's Robert Graves tells Hadley that the U.S. "must take risks" if it is to achieve "great gains." Hadley responds, "but then the uneasy state of the world puts everything on a gambling basis I guess." "Yes," Graves responds, "but not as much as a gamble as you might think." He then points to an engineer standing upon the deck: "Take that man over there, he and his company have put a great deal of thought into the engineering and design of 'Mike.'" The ideology of technical mastery is in this way concentrated on the *human*, not the machine. Indeed, at the conclusion of the public version of *Operation Ivy,* Val Peterson, Chairman of the AEC, exhorts viewers of the film, "In light of the picture [of the mushroom cloud] which you have just seen I ask to ponder these concerns in your heart and in your conscience as *a responsible American citizen*" (emphasis added). Humans, not machines per se, appear both aboard the *U.S.S. Estes* and in America as a whole as the locus of nuclear control.

Or, as Henry Fonda's presidential character in *Fail-Safe* (1964), another film about nuclear risk (this time a fictional film about losing big), says in a moment of crisis, "All I know is that men are responsible!" This responsibility, however, is fraught with tensions inherent within the association of "rationality" with instrumental control. Fonda's character most directly means "culpable," but his cry and the Peterson's identification of the "responsible American citizen" carry with them other senses of "responsible," particularly, "having control over" and "trustworthy." Implicit within *Fail-Safe*'s narratives about the catastrophic breakdown of machines and humans in the atomic age is a strong argument that, as the film's screenwriter Walter Bernstein has said, "Humans made it, humans can do something about it."[11] While *Fail-Safe* is a powerful protest of the atomic age—and thus a kind of counter-hegemonic narrative—this pivotal claim is but a re-articulation of that made by Peterson in explaining "responsibility" at the conclusion of *Operation Ivy*:

> Two course of action must be followed in the long and difficult road to peace: first, unceasing efforts to reach international agreement upon such a sound proposal as President Eisenhower made to the United Nations for the constructive use of atomic energy in the service of all mankind. This requires better and deeper understanding of the problems it faces upon the part of the American public. Second, prudence dictates steadfast preparation by us at home to back up our president as he goes into the counsels of the world in order that he may lead from

> strength, strength based upon an assurance that the American people are prepared to withstand any assault. This is no simple thing to do.

Indeed, the complexities of "better and deeper understanding" and "steadfast preparation . . . to withstand any assault" mirror the ideology of technical mastery: national survival, in Peterson's view, hinges on the American people themselves becoming rational instruments of the arms race. Both Bernstein and Peterson agree that humans—that is, a certain class of humans—can "fix" through instrumental action the crises of the nuclear age. They differ only on the nature of the crisis.

"Men are responsible" in part because nuclear hegemony depends on a particular vision of the human, a vision embodied in and performed by the technician: competent; rational but not "mad" with science or power; capable of "great feats" but only as a member of a dependable work force. The nuclear technician represents a *class*, a decidedly "middle" class. He is expert but not genius, hard-nosed yet humane, a master of machines with no evident wish to be an overlord of people. He is, in short, thoroughly socialized to middle-class values within American industrial society: dutiful, responsible, patriotic, even cowboyish. In the 1960s it was the space program more than any other cultural text that asserted this view of the technician. NASA's "Houston" stood as a visible "pacific" model of the cloaked Strategic Air Command, reassuring Americans and the world that, as Columbia Picture's disclaimer read at the end of *Fail-Safe*, "a rigidly enforced system of safeguards and controls insure that occurrences such as those depicted in this story cannot happen." If American astronauts had the "right stuff" to make them national heroes, Houston's flight controllers, engineers, and managers represented the middle-class basis of the American technological exploit that assures the "responsible" pursuit of complex tasks.

A caricature of this vision is evident in the Looney Tunes' 1960 *Crockett Doodle-Doo*. The plot is cartoonishly simple: Foghorn Leghorn, an overgrown rooster with a strong Southern accent, meets the little Egghead Jr. on the edge of the woods, just past the farm. Egghead is seated on a barrel, reading a book, *Basic Research in the Physical Sciences* by "Prof. Newt Ronn." Foghorn declares to the audience, "Now that, I say that, is no way for a kid to be wasting his time, reading that long-haired gobbledygook." "Boy, I say boy," he shouts, turning toward Egghead, "I say I'm gonna take you out to the woods, and learn ya 'bout scoutin, woodcraft, real Davy Crockett stuff!" Egghead, who does not speak, shakes his head to express his lack of interest. Nevertheless, Egghead joins Foghorn in the woods for a series of challenges: who can make a fire, who can call ducks, and who can produce smoke signals. In every case, Egghead puts down his book and betters his rival with "up to date" technologies: matches, a manufactured duck call, and a projection device. Then Foghorn, now wearing an Indian headdress, admits, "Pretty sneaky. But I got, I say I gotta, show the

Egghead I still got a couple of Indian tricks up my sleeve." Using a hidden watering can, he prances about "Indian style" and pretends to make it rain. Egghead in turn, makes a simple paper airplane that he loads with a small container bearing a chemical compound. The compound, in turn, produces a thundercloud that ends up not only soaking Foghorn, but frying him. The cartoon then culminates with battle over who can build the better trap, with Foghorn, of course, ending up hung upside down from a tree in Egghorn's contraption. "Hey boy," he says, "got anymore of those long-haired books?"

The class and regional markers in *Crockett Doodle-Doo* are evident. Foghorn is backwoods, primitive, poor, white, and Southern. Egghead is a would-be Yankee, studiously aspiring to "get off the farm" and enter a civilized technological order. The class hierarchy of the piece is even clearer: Foghorn is "schooled" by Egghead, and left "lynched" from his feet, begging for some "long-haired books." (Foghorn is a caricature of the Southern white supremacist—intolerant, assertive, and brutal.) White middle-class Yankee society thus decisively triumphs over Dixie barbarity. Circa 1960, the tale no doubt evoked, among other things, the recent memory of Little Rock. However, this class-based story is catalyzed not by a conflict over inclusion, but by Professor Newt Ronn's *Basic Research in the Physical Sciences*, which Egghead so studiously reads. Indeed, "basic science" was a major concern of the Eisenhower administration: it was a concept critical to the nation's military defense enterprise, to civil defense, and to internal security.

With regard to military technologies, "basic science" was seen as the foundation of American technological superiority over their Soviet rivals. On March 15, 1956, Eisenhower's National Security Council requested a presentation "on the problem of technological superiority be made by the Department of Defense, the Office of Defense Mobilization, and the National Science Foundation." The White House had grown increasingly concerned that the Soviets were "making rapid strides" in basic scientific research and was on the cusp of overtaking the U.S. "in the education and training of scientific and technical personnel."[12] On May 31, the representatives of the DOD, ODM, and NSF made their presentation to the NSC. Alan Waterman of NSF argued that "basic research" was the key ingredient to maintaining America's technological superiority, and thus edge in defense. "The most decisive factor for us in the struggle to maintain scientific and technological leadership is manpower, and above all its quality and competence," he argued. The broad promotion of "basic research" could be the bedrock of a large corps of scientists, engineers, and technicians.[13] Consequently, shortly after the presentation Eisenhower directed that DOD, NSF, and the Department of Health, Education, and Welfare develop programs "to meet the problem of maintaining free world technological superiority over the Soviet bloc," of which *Crockett Doodle-Doo* was a reverberation.[14]

With respect to civil defense, "basic science" represented a dispositional ideal. Scientists, engineers, and technicians embodied a model of calmness, rationality, and deliberation—a kind of "democratic" deliberateness before great challenges, where problems are "internalized," solutions objectively debated, and action-plans followed with discipline. Indeed, the 1956 "Report to the President and the National Security Council by the Panel on the Human Effects of Nuclear Weapons Development" advised the president to embrace the scientific study group as a model for educating the public on the risks of nuclear war. It discouraged a "mass communications media approach," urging instead locally-run discussion groups which would, like a scientific study group, abide by norms of calm and collected rational consideration: "We believe that such issues can be discussed in an atmosphere of calm deliberation with less emphasis on the symbols and images of disaster that so often characterize the emergency approach to attention getting, but which carries the danger of provoking apathy and hysteria."[15] In this way, the studious Egghead, calmly reading Prof. Newt Ronn's book and applying its basic principles to his tango with the barbarous Foghorn, represented a *dispositional* model integral to the processes of nuclear hegemony. Neither apathetic nor hysteric before Foghorn's "feats," Egghead simply takes his book knowledge and outdoes his rival.

Finally, "basic science" was a concept implicated in matters of internal security against espionage, treason, and other forms of disloyalty to the nation. According to a 1955 FBI pilot study, *laborers* posed a significantly greater risk to internal security than engineers and technicians among government contractors. Technicians, draftsmen, and mechanics, on the other hand, had the fewest incidents of subversion (with engineers having more incidents than the latter, but far less than laborers). In fact, labor, especially labor strikes, presented serious challenges to both the Truman and Eisenhower administrations in the 1950s. The 1950 Defense Production Act was aimed at ensuring government command over defense production, granting the executive branch power to requisition plants and property, raw materials, and to institute wage and price controls. On April 9, 1952, Truman notoriously nationalized the steel industry as the steel workers prepared to strike amidst the war in Korea, only to be rebuffed by the Supreme Court in *Youngstown Steel & Tube Co. v. Sawyer.* And in 1954, labor strikes at the nuclear production facilities in Oak Ridge, Tennessee and Paducah, Kentucky caused the Eisenhower administration a great deal of trouble. Eisenhower's AEC warned that they "will have a serious effect on programs of the Commission which are directly related to the national safety," a conclusion with which the president's specially appointed Board of Inquire concurred. Thus, on August 11, 1954 Eisenhower requested, and was granted, an injunction against the strike.[16] In this way, the FBI's "findings" were not surprising: the "disloyalty" of laborers was part and parcel of a governmental structure of differentiation, in which laborers were pitted against other working-class groups like technicians and engineers who

were seen as not only more competent, but more loyal, than laborers by virtue of their grasp of the unique challenges of the nuclear age.

With the centrality of "basic science" to government visions of national defense and security in mind, Egghead retains all of his Yankee middle-class identity, but gains even more definition. Studiously reading Prof. Newt Ronn's book, he is a nascent nuclear technician, and, as such, a model American citizen. His ability to apply the basics of science seemingly effortlessly to the operation of tools, instruments, and technologies signifies that he is capable of contributing to the national defense via the upkeep of America's "technological superiority," that he will be calm, collected, and rational in the face of nuclear risks, and that he will be loyal to the nation, attune to the challenges of a nuclear age. Egghead is a "post-industrial" *operator*, a loyal and contributing member of a nuclear nation. Foghorn, on the contrary, is Southern laborer who, like the laborers in Tennessee and Kentucky, still operates within the politics of an older "industrial" order, and thus undermines the nation's nuclear defense measures.

EVERYONE AN OPERATOR, EVERYONE A SOLDIER

If Egghead was a model American because he studiously masters basic science and thus achieves technical mastery, then technical mastery was no longer being protected as the exclusive possession of an elite class, as it had been well into twentieth-century industrial society. Technical mastery had been popularized, making its way even into the backwoods of the South (at least among the young). Publications like *Popular Mechanics,* which were widely popular among boys in the 1950s and which were dominated by pieces on atomic science, testify to an expanding technical class, one that became virtually identical with a white middle-class and thus with "mainstream America."

The evolution of American technical expositions overseas shows this expansion. While such expositions had a relatively long history—most notably, the 1893 Columbian Exposition in Chicago—in the 1950s, amidst the battle for "technological superiority" between the Americans and the Soviets, they took on special importance in state-sponsored propaganda efforts. The first such U.S. sponsored exhibit focused exclusively on atomic energy was the International Conference on Peaceful Utilization of Atomic Energy in Geneva in August, 1955, a key component of Eisenhower's expansive "Atoms for Peace" propaganda program. The exhibition—facilitated with the cooperation of American corporations—featured atomic technologies for medicine and industry. For example, a machine for calibrating "thyroid uptake" (likely using radioactive iodine) was shown, featuring a young, white, and nude female mannequin as its subject (the thyroid affects metabolism, protein levels, and sensitivity to various hormones). Diagrams of chemical plants related to atomic energy were also featured.

A principle attraction was an atomic reactor built at the Oak Ridge facility and shipped to Geneva. Throughout the exposition, in both American and Soviet exhibits, lab-coat donning scientists and technicians displayed massive control panels, worked instruments, and explained dials and gauges.[17] Thus, *le personnel technique* (masc.) and their atomic machines dominated the Geneva conference.[18]

The U.S. and the U.S.S.R. engaged in a series of such expositions on the "peaceful uses" of atomic energy in the latter years of the 1950s, each government trying to claim for itself the mantel of peace. In the judgment of the U.S. government, the U.S. efforts were "highly successful." "The United States," a joint AEC and Department of State report on a 1958 exhibition stated, "held a dominant role generally through the quality and number of its technical papers and impressive technical exhibits. The latter was regarded as the finest scientific exhibition ever assembled."[19] Atomic science and technology, therefore, came to stand in for science and technology more broadly.

However, the well-known 1959 American National Exhibit in Moscow was different. Housed under a giant "sunburst pattern" aluminum dome in Sokolniki Park, thus architecturally establishing atomic science as the overarching American technological achievement, the Moscow exhibit was a far more expansive elaboration of the wonders of atomic energy than the prior conferences on the "peaceful uses" of atomic energy had been. The U.S. exhibit featured the themes of "Land and People," "America Lives," "America Works," "America Produces," "America Consumes," "America Learns," "America Explores Man and the Universe," "America Creates," "America Travels," "America Plays," and "American Community Life." The idea behind the plethora of themes, formulated by the U.S. Information Agency, was "getting our message to the Soviet people" in kaleidoscopic fashion, focusing on the benefits of American technological superiority for a consuming middle class.[20]

Thus, perhaps surprisingly, the *kitchen*—the site of the infamous "kitchen debate" between Soviet Premiere Khrushchev and Vice President Nixon—proved to be one of the most highly charged "messages." Thematized as "America Consumes," the display featured such things as a demonstration of a "DeLuxe kitchen," plastic, rubber and aluminum kitchen equipment, electrical appliances, a food demonstration (including packaging, preservation, cooking, ready mixes, frozen foods, canned foods), and snack bars and automatic food and drink vending machines. In the so-called Kitchen Debates, Khrushchev dismissed these consumer items as "silly," provoking Nixon's poking finger and an apparent *non sequitur*: the Vice President's demand, in response, that the Soviets not make any unilateral demands at the upcoming Four Powers Conference.

A *non sequitur*, however, it was not, at least not from the perspective of an expanding nuclear hegemony. The kitchen in the 1959 Moscow exhibit represented the diffusion of the American nuclear technician into the

domestic, everyday, and feminine. No longer the subject of atomic technology—vulnerably positioned before the machine—the white, middle-class American woman gained at the Moscow exhibit the status of an "operator," seamlessly manipulating a myriad of devices in running her efficient, technologically sophisticated home. Indeed, the American exhibit subtly collapsed a series of distinct spaces by focusing on the technological possibilities of "small" spaces (e.g. the kitchen, the micro-apartment, and the modest prefab home). The exhibit testified to the possibilities technology had created for the airship, the space station, the fallout shelter, the bunker, and the underground atomic control room. "America," it asserted, can "work," "produce," "consume," "play," "explore," "create," "learn," and even "travel" within small, technologically sophisticated spaces.

Thus the point of the Moscow exhibit, albeit implicit rather than manifest, was that *all* Americans were coming into the atomic age, *all* Americans were becoming technical masters, capable of thriving within the new, smaller confines of atomic architecture. Even as Radio Free Europe and Radio National Liberation tried to convince peoples behind the Iron Curtain that Soviet technological success—most spectacularly in *Sputnik*—came at the expense of the people's general standard of living, America's supremacy in consumer goods and maneuvering in small spaces suggested the presence of a citizenry prepared, en masse, to manage a technological war. Thus, what was conspicuously missing from the themes at the Moscow exhibit was in fact its overarching implication: America *fights*, and fights as technical masters. Even the *women* of America, as the kitchen exhibit stressed, can manipulate the machine.

The development of this sort of American universal conscription was provocatively explored in Frederick Wiseman's *Missile* (1987), a documentary film about the 4315th Training Squadron of the Strategic Air Command at Vandenberg Air Force Base in California. The film follows, among others, several women being trained to work as Minute Man II (a land-based nuclear ICBM) operators at Whiteman Air Force Base in Missouri. Whiteman had distinguished itself in the 1980s as the home of the first Strategic Missile Wing to accept women operators, and *Missile* hinges on the image of a two-woman team operating a nuclear control panel as efficiently as the women of America's "kitchen" in the Moscow exhibit.

Indeed, *Missile* explores *Fail-Safe*'s claim "Men are responsible!" by complicating it. A daylong session on ethics and "deterrence" makes up, by far, the longest scene in the documentary, and is a window into SAC's conception of "responsibility." At the beginning of the session, students are told that at the end of the day they will be asked to sign a statement expressing that they have "no reservations" about inserting launch keys if given the order from the president. The purpose the day's session, the senior officer explains, is to help the trainees prepare for signing the statement. "We want you to fully comprehend the awesomeness of this responsibility," he explains. "We don't want you to be robots." Nevertheless, they are

told that their signature means that they will, without question, follow the orders given, trusting, as the senior officer says, that "the president of the United States is not going to ask you to insert those launch keys until there's just no other option. It's the final solution." The moral responsibility of the trainees therefore is condensed into a signature of assent. On the other side of the signature, the only responsibility of the SAC operator is instrumental efficacy: transcribing code, reading gauges, rotating dials, flipping switches, and turning keys. In this way, the focus in *Missile* on the daylong ethics instruction plays on the evident disproportionality of SAC training: one day of a fourteen-week program is devoted to the question of the moral responsibility of the nuclear operator, and that responsibility is reduced to what is an essentially legal procedural act. The remaining ninety-seven days are devoted to strictly instrumental concerns. Nuclear hegemony, *Missile* suggests, is contingent on a more fundamental instrumental hegemony.

This instrumental hegemony is most subtly explored as the film probes the inclusion of women within the training of nuclear operators. On the one hand, *Missile* shows the trainers speaking and acting before the training squadron as if there were no sex-and-gender differences among the group; everyone is neutered into an operator-soldier. On the other hand, in featuring a meeting exclusively among the all male trainers, where the men are exhorted to avoid "fraternization" with students, especially now that women are among the group, *Missile* shows that the "egalitarian" approach of SAC is consciously created, even enforced. Women trainees have in fact disrupted the norms of behavior at SAC, but the operational life of the program must not show it. In this way the assertion of instrumental neutrality that underlies the claim "Men are responsible!" is extended to personnel. To retain "feminine" and "masculine" within the program would be undermine the fundamental logic of instrumental neutrality precisely because, as *Missile* shows, *operators are instruments*, having signed off their moral selves to an operational command-and-control structure.

Still, sex-and-gender differences are manifest in the film's portrayal of the training program. In an introductory session on instrumental operation, several of the women trainees tell the squadron that Whiteman's unique initiative to bring women into the ICMB corps drew them to the program. And we see SAC forming their two-person commander and deputy teams along sex lines, evidently to avoid any problems feared from coupling male and female in small underground control rooms for extended periods of time. Indeed, the film's denouement comes when a two-woman team moves through a launch practice run without any errors, earning an "outstanding performance" mark. "Your crew coordination throughout the evaluation was outstanding," a senior male officer tells them during a debriefing. "Checklist discipline especially . . . You can tell that you trained very hard to get to this level readiness." Relative to the typical modes of expression among the subjects of the film, the women become effusive upon hearing the news, emotionally embracing one another. *Missile* thus does for issues

of sex and gender what it did for issues of morality, highlighting the contradictions of the training program through disproportionate attention to the tensions of SAC's participation within an instrumental hegemony.

Within this hegemony, the nuclear technician is an ideal American citizen because its (*nuet.*) technical mastery can be thoroughly neutralized, militarized, and operationalized. If, as Susan Zaeske has argued, the "signature" has played a crucial role in the assertion of political agency in U.S. history, especially for women, SAC's signature is an emblem of a counterforce in modern democracy: the universal subscription of all citizens into the instrumental war aims of the modern democratic state (first seen in Napoleon's *Grande Armée*).[21] The passage of women in the 1950s from subjects of atomic technology, seen in the 1955 thyroid calibrating machine at the Geneva exposition, to the operators of technologies housed under an atomic canopy, seen in the 1959 Moscow exhibit, to atomic operators, seen in *Missile*, represents a significant advance for nuclear hegemony, "democratizing," as it did, the nuclear operator, diffusing "it" into the whole of American mass culture. Just as a giant sunburst pattern aluminum dome covered the American exhibit in Moscow in 1959, so the diffusion of instrumental, interface-based technologies into American mass culture in the 1950s, 60s, and beyond brought the entire nation under the cover of nuclear power.

CONCLUSION

Ignition keys, "touch and go" microwaves, GPS, push button toasters, easy control blenders, equalizers on stereos, digital gas pumps, television remote controls, dial-up pizza delivery, programmable thermostats, synthesizers, text messaging, CB radios, voting levers, toy ray guns, parking meters, dialysis machines, surveillance devices, drones, robotic manufacturing, programmable waffle makers, keypad entry systems, combine cabs, video games, digital dashboards, personal computers, Lite-Brite, kiosks in subway stations, computer notebooks, jet airplane cockpits, droids, credit card machines, technical support menus, markable pdf files, shoe phones, cell phones, iPhones, and the vast interface mediated realm we call the internet. "We are all operators," or so it would be.

To be sure, post-war American consumer technologies had a complex life, one that can be looked at apart from the development of nuclear technologies. Yet, our argument is that nuclear hegemony, understood as a dynamic "claim to" nuclear-centric political power by a ruling elite, came to cover in the 1950s the whole of American consumer culture. The nuclear operator, once standing heroically as an icon of technical mastery, was transformed into the technologically savvy housewife, the tricked-out farmer, the increasingly digitized office worker, the disco drummer, the videogame junkie, and the countless iterations of

technicians operating everything from air-conditioning units to stadium public address systems.

This transformation, we suggest, was at once aesthetic and mnemonic. Aesthetically, nuclear hegemony claimed the American consumer-citizen as a kind of mundane metonym. Just as in the mid-1950s the nuclear technician stood as an iconic figure of rational control and technical mastery within official government rhetoric, so the Moscow Exhibit bore witness to the transference of this iconic logic to the middle-class American. The mundane absorbed the sublime, turning "every" American into a metonym for the rationality of nuclear technologies.

This aesthetic movement, of course, follows the logic of "hegemony" as explicated by Antonio Gramsci, Raymond Williams, and others, wherein the dominated class comes to "consent" to its own domination by a ruling class. It also, to be sure, makes nuclear hegemony vulnerable to counter-hegemonic resistance as operators "seize the controls" to put into question the nuclear state (e.g. as in *War Games* (1983), which like *Fail-Safe* challenges the reliability of our machines, but this time through the mundane figure of a computer-happy "whiz kid"). Yet, in acceding through consumer culture to the claim of technical mastery and instrumental rationality, we invariably perform in our most mundane operational actions the logics that created nuclear hegemony.

Curiously, contemporary reappropriations of the Atomic Age forget the crucial role operators played in rationalizing nuclear technologies. The memory practices of modernity are inextricably tied to the sublime. To be remembered, to be registered as significant within collective memory, is to be marked with some aspect of fear, wonder, or awe. That within the memory of nuclear iconography, still remarkably active in the discourses of nuclear energy and nuclear terrorism, the operator has been forgotten, buried both within mass culture and in the archives the nuclear complex, means only that our modern memory culture is oblivious to the mundane, and thus to the myriad of ways subjection is realized, indeed operationalized.

This is an important function of the visual in memory practices. Through their participation in the sublime, traditional monuments resist being operationalized—we return to them the way we return to a park, a liminal space that does not fit in everyday flows. For ambivalent memories, this is not a desirable rhythm, we wish to forget these events altogether. There are few better ways to collectively forget than to hide such unpleasant memories in plain sight, and there's no better place to hide them than in the mundane visual flow of media images.

At the same time, what has been forgotten, the operator, was crucial to the public record of the specific, historical origin of the Atomic Age in the destruction of Hiroshima and Nagasaki being *lost*. A myth of origins has acceded to a myth of timelessness—indeed a boon to nuclear hegemony. For even if the archive of nuclear power and production is around us, as a kind of living repository of memories of how "we" achieved the right to

nuclear dominance, our internalizing it to the point that we do not recognize it as having originated—as *historical*—means that with respect to nuclear power we live in a memory culture without referents. One function of monuments without referents is to establish the state as timeless. Where there is no myth of origins, there is nothing transitory, contingent, or precarious. And this can only serve nuclear hegemony.

Yet, it can undermine it too, for in forgetting the special status of the nuclear technician we may see its increasing scarcity within the means of nuclear production. Indeed, the 2008 Report of the U.S. Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, *World at Risk*, suggested as much, admonishing the U.S. government to "protect," as a "national resource," the nuclear technician:

> With regard to nuclear weapons, the number of technical experts available to the intelligence community is declining because of retirements and the reduction in innovative nuclear weapons-related work at the U.S. national laboratories. Nuclear expertise remains in high demand by the intelligence community because it serves as a hedge against breakout capability and other technological surprises by state and non-state adversaries. Accordingly, such expertise should be protected as a national resource.[22]

Thus, as the icon of the nuclear technician has been forgotten, so the survival of the nuclear technician itself has been endangered. Indeed, nuclear power in America has been folded into the mundane infrastructures of the energy industry and national defense. Once lionized as a singular source of American security, prestige, and prosperity, it has become but one option among several sites of energy and defense exploitation, creating for the state a crisis in available resources.

NOTES

1. Harry S. Truman Library, Papers of Harry S. Truman, SMOF: Psychological Strategy Board Files, Box 3.
2. F. R. Gladeck, et al., *Operation Ivy: 1952* (Springfield, VA: National Technical Information Service, 1982), 5.
3. Raymond Williams, *Marxism and Literature* (New York: Oxford University Press, 1977), 112.
4. Don DeLillo, *Underworld* (New York: Scribern, 1998), 563.
5. David E. Nye, *The American Technological Sublime* (Cambridge: MIT Press, 1994), 254.
6. Williams, *Marxism and Literature*, 112.
7. Ibid., 113.
8. Andrew Feenberg, *A Critical Theory of Technology* (New York: Oxford University Press, 1991), v.
9. Byron Enyart, Memo for the Record, November 18, 1952; Stefan T. Possony, "An Outline of American Atomic Strategy in the Non-military Fields," October 6, 1952. Both documents can be found at the Harry S.

Truman Library, Papers of Harry S. Truman SMOF: Psychological Strategy Board Files, Box 37.

10. Martin Medhurst, "Atoms for Peace and Nuclear Hegemony: The Rhetorical Structure of a Cold War Campaign," *Armed Forces and Society* (1997): 23.4, 576–77.
11. Jeffery Scwarz, director, *Revisiting Fail-Safe*, DVD (packaged with *Fail-Safe* Special Edition, 2000) (Los Angeles: Automat Pictures, 2000).
12. Memo from the National Security Council, March 15, 1956, "Basic National Security Policy"; Robert H. Johnson introductory remarks on "Technological Superiority" prior to NSC presentation; see folder "NSC 5602 (1)" in Dwight D. Eisenhower Library, White House Office, National Security Council Staff: Papers, 1948–61, Disaster File, Box 14.
13. "Maintenance of Technological Superiority," Presentation before the National Security Council, May 31, 1956, folder "NSC 5602 (1)" Disaster File, Box 14.
14. NSC Memo, June 5, 1956, "Technological Superiority"; folder "NSC 5602 (1)" Disaster File, Box 14.
15. See "Report to the President and the National Security Council by the Panel on the Human Effects of Nuclear Weapons Development," (November 1956), 13, 21, Eisenhower Library, Ann Whitman Files, Administrative Series, Box 4.
16. See "Statement of the Atomic Energy Commission as to the Strike by Locals 288 and 550 United Gas, Coke and Chemical Workers, CIO" and "Report to the President by the Board of Inquiry Created by Executive Order No. 10542" in folder labeled "Atomic Energy Commission 1953–54 (3)" in Eisenhower Library, Ann Whitman Files, Administrative Series, Box 4. For Eisenhower's request for an injunction see "Letter Directing the Attorney General To Petition for an Injunction in Labor Dispute at the Atomic Energy Commission Facilities at Oak Ridge and Paducah," August 11, 1954, at John T. Woolley and Gerhard Peters, The American Presidency Project [online]. Santa Barbara, CA: University of California (hosted), Gerhard Peters (database). Retrieved October 31, 2010 from http://www.presidency.ucsb.edu/ws/?pid=9978.
17. Over seventy countries were said to have participated in the exhibit, but it was clearly dominated by the U.S. and U.S.S.R.
18. The French is drawn from a Union Carbide press release. See folder "Atomic Energy Commission—1955, Photographs," in Eisenhower Library, Ann Whitman Files, Administrative Series, Box 4.
19. See folder "Atomic Energy (9)," Eisenhower Library, White House Office, Nat Security Council Staff: Papers, 1948–61, Disaster File, Box 6.
20. Minutes of Cabinet Meeting, January 23, 1959, Eisenhower Library, Ann Whitman File, Cabinet Series, Box 12.
21. Susan Zaeske, "Signatures of Citizenship: The Rhetoric of Women's Anti-Slavery Petitions," *Quarterly Journal of Speech* 88:2 (May 2002): 147–68. See also Zaeske's *Signatures of Citizenship: Petitioning, Antislavery, and Women's Political Identity*, (Chapel Hill: University of North Carolina Press, 2003).
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