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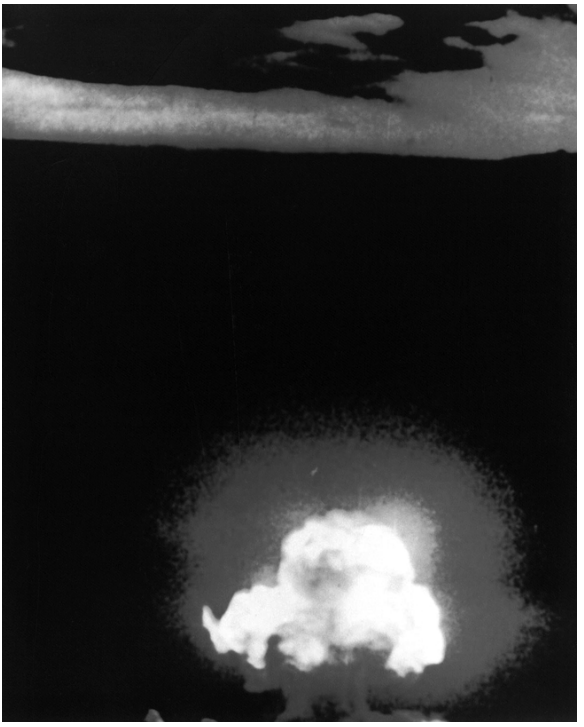
1 The Enlightened Earth

The Enlightenment has always aimed at liberating men from fear and establishing their sovereignty. Yet the fully enlightened earth radiates disaster triumphant.

—Horkheimer and Adorno, *The Dialectic of Enlightenment*

The nuclear age began in earnest in New Mexico.[1] Los Alamos scientists created much more than simply a new technology with the invention of a military atomic device in 1945; they engendered new forms of consciousness, new means of being in the world distinct from those that came before. For over a half century now, the psychosocial spaces of American modernity have been shaped by the most prominent legacies of Los Alamos: a utopian belief in the possibility of an unending technological progress, and an everyday life structured around the technological infrastructures of human extinction. The Manhattan Project not only marks the beginning of American big science and a new kind of international order; the invention of the atomic bomb transformed everyday life, catching individuals within a new articulation of the global and the local, and producing social imaginaries drawn taut by the contradictory impulses of the technologically celebratory and the nationally insurgent, as well as the communally marginalized and the individually abject.

Looking back across the temporal surface of the Cold War, the purple fireball and glassified green earth created in the deserts of New Mexico at exactly 5:29:45 a.m. on July 16, 1945, can only be narrated as a moment of historical rupture and transformation (see Figure 1.1).[2] For the detonation of the first atomic bomb marked the end of one kind of time, and the apotheosis of another, an uncanny modernity that continually exceeds the language of "national security," "mutual assured destruction," the "Cold War," or even "terror." For this reason alone, we might profitably return to the northern Rio Grande to assess the legacy and implications of one of the twentieth century's most enigmatic, yet lasting, achievements. For with the flash of the explosion known as Trinity, certain contradictions in modern life—involving the linkages



1.1. The Trinity Test, July 16, 1945, 5:29:45 a.m.
(U.S. Department of Energy photograph)

between secrecy, security, technoscience, and national identity—become increasingly extreme in the United States, and much of this book is an exploration of the anxieties and ambivalences in American power made visible by the end of the Cold War in New Mexico.

Attention to the local effects of the nuclear age, however, also promises a different vantage point on the phantasmagoria of nuclear conflict promulgated during the Cold War, both disturbing its familiarity and challenging its social purpose. Since Hiroshima and Nagasaki, nuclear war has repeatedly been marked in American culture as "the unthinkable," an official declaration that no government would willingly engage in actions that could potentially end life on earth.[3] But today, in the absence of the Soviet-U.S. global polarism and during an expanding "war on terror," we might interrogate the "unthinkability" of the nuclear age anew, and ask: What kind of cultural work is performed in the act of making something "unthinkable"? How has the social regulation of the imagination—in this case, of nuclear war—been instrumental in American life since World War II? What are the legacies of this social

project after the Cold War, in a world once again negotiating "nuclear terror"? For to make something "unthinkable" is to place it outside of language, to deny its comprehensibility and elevate it into the realm of the sublime. The incomprehensibility of the bomb is therefore an enormous national-cultural project, one whose effects constantly exceed the modernist logics required to build the nuclear complex in the first place. But what then encompasses the cultural spaces left behind when a national project of the size and scope of the nuclear complex is excised from political discourse? What happens when the submerged cultural legacies of nuclear nationalism come flooding back into the public sphere, as they did for communities in and around Los Alamos upon the end of the Cold War in 1991 or for a broader American public after the terrorist attacks on New York and Washington on September 11, 2001?

In a post–Cold War world, then, we might usefully interrogate the cultural work performed by a nation-state in managing so explicit an image of its own end, of controlling the terms whereby citizens are confronted with their own, impossibly sudden, nonexistence. For if it is reasonable, as Benedict Anderson has argued, to "begin a consideration of the cultural roots of nationalism with death" (1991: 10), then the nuclear complex remains a particularly potent national project, informing one way in which citizens imagine both their collective lives and deaths. The unthinkability of the nuclear age has from this vantage point been perhaps *the* American nation-building project since World War II. The cultural logic of ensuring the "immortality" of the nation, which Anderson has shown is characteristic of the modern nation-state, is also, however, immediately compromised by the reality of nuclear weapons. The contradiction nuclear arsenals evoke is that as more national-cultural energy is put into generating "security" through improved weapons systems, the vulnerability of the nation to new military technology is ever further revealed; indeed, as the U.S.-Soviet arms race demonstrated, it is worked out in ever-exacting detail. The pursuit of "security" through ever-greater technological means of destruction thus troubles the nation's internal coherence by constantly forwarding the everyday possibility of the ultimate national absence. Indeed, what Paul Edwards (1996) has called the "closed world" system of American Cold War technology—the ideological commitment to encompassing the globe with perfect technologies of command, control, surveillance, and military nuclear power—ultimately offered nuclear superpowers a perverse new form of immortality, one drawn from the recognition that a nuclear war might well be the last significant *national* act on earth.

The "unthinkability" of the nuclear age has right from the beginning, then, produced its rhetorical opposite; namely, a proliferation of discourses about vulnerability and insecurity.[4] This is easiest to see in the periods of

heightened international tensions of the early 1950s, 1960s, 1980s, and 2000s, when the unthinkability of nuclear war, in fact, made it impossible for many in the United States to think about anything else. But even in periods of relative international calm, Cold War nuclear discourse retained a specific trajectory in the United States, one that inevitably focused attention on the imagined end of the nation, and thus of life itself. Given that a nuclear war has not yet occurred, this apocalypticism remains at the level of a national imaginary. Nevertheless, an imagined end to the nation, or the human species, energized the argumentative core of (post) Cold War nuclear discourse and continues to this day to enable social movements both for and against the construction of the U.S. nuclear complex.[5] In other words, the nuclear politics of the Cold War, the steady discourse and counterdiscourse of nuclear/antinuclear commitments, has promoted a specific apocalyptic vision in the United States, one that has made it difficult to see how the nuclear age has already impacted everyday lives.

With the end of that multigenerational project known as the Cold War, we might now interrogate the repressed spaces within nuclear modernism; that is, the social logics, technoscientific practices, and institutional effects that were rendered invisible by this national fixation on extinction. We can now examine how more than a half century of international work to construct a global nuclear economy has affected everyday lives on a local level, paying attention to the regional and cultural complexities and specificities of life in the nuclear age. For while we all still live in a world quite capable of nuclear war, the cumulative effects of the nuclear complex are already both more subtle and more ever-present than (post) Cold War culture has allowed, affecting some lives more than others, and impacting local ecologies and cultural cosmologies in ways that we have yet to recognize fully. To approach nuclear technologies from the quotidian perspectives of tactile experience, focusing on how people experience an orientation in time and space, and an individual relationship with a national-cultural infrastructure, is to fundamentally rewrite the history of the nuclear age. Indeed, attention to the local effects of the nuclear complex makes strange the invisibility of the U.S. arsenal in everyday American life, and allows us to interrogate the national-cultural work performed in the act of making so enormous a national project reside in the "unthinkable." Consequently, it may be more useful to approach nuclear war as a phantasmagoria, a spectral fascination that distracts attention from the ongoing daily machinations of the U.S. nuclear complex. Indeed, the constant end game articulation of nuclear discourse has, I think, enabled two of the most profound cultural achievements of the nuclear age: the near erasure of the nuclear economy from public view, and the banalization of the *U.S.* nuclear weapons in everyday

American life. The consequence of this historical structure is that the U.S. nuclear complex is primarily visible today only in moments of crisis, when the stakes of nuclear policy are framed by heightened anxiety, and thus, subject, not to reassessment and investigation, but to increased fortification. The material and cultural effects of U.S. nuclear weapons—involving local, national, and global structures—are more deeply embedded in everyday life than is visible in moments of national crisis, making a contemporary analysis of the regional effects of the Manhattan Project simultaneously an ethnographic study of a specific technoscientific project, a sociocultural investigation into American Cold War culture, and an anthropology of American power in the twenty-first century.

THE NUCLEAR STATE OF EMERGENCY

> From the invention of the cross-bow in the 12th century, to gunpowder in the Middle Ages, to Alfred Nobel's invention of high explosives, man has had but few restraints on having learned how to kill more effectively. Our ability to destroy each other reached new heights early this century with the invention of mustard and nerve gases, and airplanes and submarines deployed in war. By World War II, mankind had escalated its ability to kill 55 million people in one war. The atomic bomb changed all of this . . . Over 80 million of the 100 million war related deaths so far this century occurred in its first half. I believe the devastation and the psychological impact of Hiroshima and Nagasaki combined with the realization of even greater destructive power of modern nuclear arsenals, drove deterrence diplomacy and bought us time. It appears that for the first time in human history mankind has paused and not used the latest technological innovation in warfare . . . However, the resulting "peace" was an uneasy one at best as the Soviet Union and the United States built nuclear arsenals totaling the destructive power of millions of Hiroshimas.
> —Sig Hecker (director, Los Alamos National Laboratory), *Reflections on Hiroshima and Nagasaki*

> The tradition of the oppressed teaches us that the "state of emergency" in which we live is not the exception but the rule. We must attain to a conception of history that is in keeping with this insight. Then we shall clearly realize that it is our task to bring about a real state of emergency, and this will improve our position in the struggle against Fascism. One

> reason why Fascism has a chance is that in the name of progress its opponents treat it as a historical norm. The current amazement that the things we are experiencing are "still" possible in the twentieth century is not philosophical. This amazement is not the beginning of knowledge—unless it is the knowledge that the view of history which gives rise to it is untenable.
>
> —Walter Benjamin, *Theses on the Philosophy of History*

Sig Hecker's statement offers a compelling modernist history of the nuclear age, a Cold War narrative of nuclear technology "buying time" for humanity even as the stakes of national conflict grow ever higher. As director of Los Alamos National Laboratory (LANL) (1985–97), Hecker's primary job was to certify the viability of the nuclear arsenal, to ensure that the United States maintain the ability to inflict "overwhelming power" against any would-be aggressor. His genealogy of the bomb—moving from the crossbow to the thermonuclear warhead—forwards weapons science as an inseparable component of historical progress. Published in LANL's *Newsbulletin* on the occasion of the fiftieth anniversary of the atomic bombing of Hiroshima and Nagasaki in 1995, Hecker's essay reiterates the necessity of nuclear weapons as a means of deterring both nuclear and conventional war. He ends with a call for Los Alamos employees to "keep the horrid images of Hiroshima and Nagasaki in front of us as a stark reminder of what we must avoid" and to focus attention "on dealing with the current nuclear dangers to the benefit of mankind so that at the 100th anniversary people can look back and say the Manhattan Project turned out all right."

What is remarkable in this statement is not simply the brute calculation of life attributed to the U.S. nuclear arsenal—80 million killed in twentieth-century wars before the bomb, 20 million after—or the taken-for-granted assumption that the existence of nuclear weapons prevented a third World War in this century; it is that Hecker seems to suggest that the bomb's primary power is cultural not technological: nuclear weapons affect how people think. But while the cultural work of the bomb may have postponed a nuclear war with the Soviet Union, it did not slow the commitment to developing technologies of mass destruction. Between August 6, 1945, and August 6, 1995, the power of nuclear weapons, as Hecker notes, increased many thousandfold, and technologies were invented to deliver U.S. nuclear weapons to any part of the world in less than thirty minutes. Hecker's notion of the cultural work of the bomb is, then, quite specific, one based on separating the social effects of the bomb from the reality of the bomb

itself. For implicit within the cosmology of weapons scientists is an understanding that nuclear technologies are now forever part of the world system, and consequently, the need for a state-of-the-art nuclear arsenal, as a deterrent, is a near-permanent feature of modern life. Thus, the Manhattan Project can never really end. It can, however, "turn out all right" in Hecker's view, if a national commitment to new technologies enables renewed investment in nuclear power, a global system for tracking plutonium, environmental cleanup of contaminated sites, safe storage of nuclear waste, and ongoing investments to maintain a state-of-the-art nuclear arsenal. Within this philosophy of history, the end of the Cold War offers merely a moment of pause, a chance to readjust the trajectory of the Manhattan Project, but it does not significantly reduce (indeed, in some ways it reenergizes) the technostrategic worldview that enabled the U.S. nuclear complex to become ubiquitous in the first place.

Walter Benjamin's, like Hecker's, theory of progress is grounded in the terrifying reality of World War. But whereas Hecker looks to technology to provide solutions to nationalist violence, Benjamin looks for answers in the vulnerability of the human body to modern technology. Benjamin wrote the "Theses on the Philosophy of History" while trying to escape an advancing Nazi army in 1940. It has often been evoked by contemporary Euro-American scholars as a prescient critique of the anesthesia-effect of modern life, the increasing sense of isolation and insulation from experience brought about by the combined effect of the swift pace of new industrial technologies and a flood of new urban forms (see Buck-Morss 1991). Benjamin believed this overstimulation of the body after World War I forced individuals to retreat inward, to take psychological refuge from the new dangers of an increasingly industrialized world by cutting themselves off from sensory experience, by anesthetizing themselves in everyday life.[6] By drawing together contemporary social forms and their recently outmoded predecessors to create a "dialectical image," Benjamin sought to produce a "shock" effect, one that revealed the constantly reconstructed sameness of modern life, enabling people to break through the trancelike state produced by a sea of changing commodities and technologies, and envision an emancipatory social movement. In this way, he sought to create "a real state of emergency" that would disrupt the historical possibility of fascism by changing the terms of "progress" to emphasize not the machine, but the quality of everyday life and the fragility of the human body.

Though Benjamin did not live to enter the nuclear age, his critique of modernity in the 1930s remains relevant to any investigation into how nuclear technologies have affected everyday life since the bombing of Hiroshima and Nagasaki. For Benjamin saw not only the liberatory potential of technology but also how the aestheticizing effects of

technology could enable new kinds of mass control, making industrial warfare even seem beautiful, and therefore, seductive (1969b: 241).[7] In his most celebrated essay, "The Work of Art in the Age of Mechanical Reproduction," largely remembered for its embrace of technology as a form of social revolution, Benjamin also warned that "all efforts to render politics aesthetic culminate in one thing: war" (1969b: 240–41; see also Buck-Morss 1992). The aestheticizing of nuclear technology by nation-states during the Cold War would elevate Benjamin's question about the social consequences of industrial technology into the realm of planetary survival. Indeed, America's initial response to fascism was profoundly modernist: it consisted of a radical break with history achieved through a new industrial technology, the atomic bomb. The Manhattan Project, quite subversively, produced the kind of "shock" effect Benjamin had hoped to achieve—a new experience of everyday life grounded in the vulnerability of the human body. In the brief window between the bombings of Hiroshima and Nagasaki and the start of the Cold War, many in the United States, including some of the primary figures at Los Alamos, believed that the achievement of the atomic bomb made war obsolete as a means of solving conflict and initiated a global movement for the control of nuclear technologies.[8] America's explosive entry into the nuclear age, thus, produced a flash of insight enabling some in the United States to imagine a fundamental restructuring of (inter)national order. This detonation in political consciousness was on the order of what Benjamin hoped to achieve through his critical work, as national violence was now irrevocably tied to the possibility of human extinction, a reality that seemed to demand imaginative new possibilities for organizing social life.

Nuclear weapons, however, quickly became not merely a "historical norm," they became the preeminent national fetish in the United States. With the official start of the Cold War after the Soviets' first nuclear test on August 29, 1949, nuclear weapons became the one true sign of "superpower" status and the ultimate arbiter of "national security." Constant technological improvements in the scope and versatility of nuclear weapons and missile systems ultimately enabled a global achievement of "mutual assured destruction" (or MAD)—a technoscientific belief system that promised immediate retaliatory nuclear strikes for any nuclear aggression. During the Cold War, the logics behind MAD led to a constantly shrinking window of warning for an incoming nuclear strike. In other words, technological advances within the nuclear complex were paralleled by a global contraction in time and space, creating a "closed world" of American and Soviet technology, which, by the early 1960s, was always less than thirty minutes away from a global firestorm. At the beginning of

the twenty-first century these technological systems remain firmly in place: the United States and Russia each maintain over ten thousand nuclear weapons in their arsenals and continue to have nuclear submarines on constant alert, positioned to launch immediate and overwhelming nuclear (counter)strikes. Thus, the technological infrastructure of the Cold War lives on, as do the cultural and environmental effects of our first half century in the nuclear age.

By tracing the transformation of nuclear weapons from a technology producing cultural critique to a technonational fetish, we can see a counterhistory to Hecker's story of technological progress. Following Benjamin, we can trace the cultural reception of preceding "catastrophic" technologies like gunpowder in the sixteenth century or dynamite in the nineteenth century, looking for the human relations rendered invisible by the power of these technologies and noting their tactile effect on experiences of everyday life. For each of these military technologies produced psychological shocks manifested in a new awareness of the fragility of the human body, and therefore produced the possibility for new understandings about the consequences of (nationalist) violence. Each new means of destruction, however, also required a greater level of social anesthesia to normalize its impact on everyday life. For Benjamin, this dulling of the senses to violence was accomplished through a fundamental reorganization of the human sensorium under modern industrial life. The industrial revolution restructured everyday life around repetition (the factory assembly line), speed (city life), and technologically mediated violence (industrial accidents and mechanized war). The repetitive shocks to the body as sensory organ produced by these new social forms required a new means of processing stimuli, a system based not on engaging one's environment but on insulating and protecting the sensorium from it. As Susan Buck-Morss explains it (1992: 18), Benjamin believed that:

> being "cheated out of experience" has become the general state, as the synaesthetic system is marshaled to parry technological stimuli in order to protect both the body from the trauma of accident and the psyche from the trauma of perceptual shock. As a result, the system reverses its role. Its goal is to numb the organism, to deaden the senses, to repress memory: the cognitive system of synaesthetics has become, rather, one of anaesthetics.

That is, the traumatic experience of rapid technological change has produced a reversal of the polarity of the human senses, which increasingly work not to engage the world but to insulate individuals from it.[9]

We can see this new type of modernity expressed in how the U.S. military responded to one of the immediate physiological limitations of the nuclear age: flashblindness. The visual intensity of a nuclear explosion,

which reaches the brilliance of thousand midday suns, readily blinds; without eye protection the observing retina can burn, resulting in lesions on the eye and permanent blindness. In the early days of the Cold War, nuclear war planners set out to assess how the blast effects of a nuclear bomb would impact soldiers (and pilots in particular, as they would be responsible for delivering nuclear bombs in an era before intercontinental missiles). A series of flashblindness experiments were conducted at the Nevada Test Site in the 1950s that illustrates the new cognitive and anesthetic order of the nuclear age. During Operation Upshot-Knothole in 1953, twelve army volunteers were placed in a light-tight trailer with their right eyes covered. A shuttered lens was placed over their left eyes and synch-calibrated to the flash of a nuclear explosion. Five nuclear devices, ranging from seven to fourteen miles in distance from the trailer, were detonated. Each nuclear flash blinded the volunteers, allowing scientists to measure exactly how long it took their vision to return. A number of protective lenses were tested in the experiments, and the final report concludes:

> reasonably good central vision (20/40) under reduced illumination (1.57 HIT) returned in approximately 154 sec[onds] . . . Peripheral vision returned in an average of 160 seconds under 0.001 HIT luminance (approximately that of a moonless night sky) and in an average of 249 seconds under 0.00001 HIT of luminances (slightly less than moonless night sky with overcast). It is concluded that the filter of the type used protects almost all individuals from retinal burns under the conditions of the experiment and allows performance of typical visual tasks required of a pilot flying the aircraft within 20 to 60 sec[onds] following the flash of the atomic detonation.[10]

The filter protects almost all individuals from retinal burns. Here we have a demonstration of a new anesthetic system at work. These flashblindness experiments explore exactly how a new technology, the atomic bomb, traumatizes the human body, and record in minute detail the damaged body's effort (in intervals of 154, 160, and 249 seconds) to recover.[11] Flashblindness is a literal impairment of sensibility. The shock of the nuclear flash traumatizes the visual sense organ, and the process of recovery requires blindness, a deadening of the senses. Here, the technological reality of a "nuclear age" is located in the ability of the human body to recover from the trauma of a nuclear flash that is literally seared onto the surface of the observing retina. The senses that are vulnerable to the exploding bomb, however, are also transformed via the experiments, producing a new sensorium tuned to the nuclear age. Within the culture of the Cold War, the intent of these experiments was not to eliminate or avoid the trauma but to find a prosthetic device, some form of visual protection, to enable the body to be insulated from repeated nuclear flashes. Such protection would allow the

body to survive repeated nuclear shocks, but at a cost of being ever further anesthetized from a tactile experience of the world. These flashblindness experiments reveal a Cold War anesthetic system already ascendant in 1953, one enabling twelve people to volunteer for an experiment in which they were calmly strapped in a chair and, quite meticulously, blinded.

The historical process that registers each new "catastrophic technology" as the end of warfare, the innovation that makes the prospect of war "unthinkable," is ultimately through this anestheticizing process absorbed as simply another fact of modern life, one more shock to the bodily system from which the psyche requires insulation. From this perspective, the Manhattan Project represents a link in a certain modernist chain of being, one that has consistently relied on technology to solve problems of the social, and where the human sensorium evolves by deadening itself in order to normalize the ever-accelerating changes in the technological possibilities of everyday life. For Benjamin, increasing levels of social anesthesia demand new kinds of shock therapy, new means of reorienting individuals to the emancipatory possibilities in everyday life. The end of the Cold War provides a rare moment of pause in the technological advancement of a nuclear, militarized American modernity, and thus offers an opportunity to assess from a new vantage point the effects of the bomb.

In this light, the nuclear bomb is literally an explosive and an explosive cosmological practice, a world-making enterprise that can reorganize how people experience everyday life. In fact, if we locate the Manhattan Project within a genealogy not only of technological progress, but also of an ongoing "state of emergency," what is unique about the bomb is drawn less from its destructiveness than from the acceleration of time and contraction of space it produces. Paul Virilio concurs, arguing in *War and Cinema* that "weapons are tools not just of destruction but also of perception—that is to say, stimulants that make themselves felt through chemical, neurological processes in the sense organs and the central nervous system, affecting human reactions and even the perceptual identification and differentiation of objects" (1989: 6). As a means of reorganizing a tactile engagement with the everyday, nuclear technologies therefore have profound effects regardless of nuclear warfare. The instantaneous destructive power of nuclear weapons and the long-term dangers posed by nuclear materials—*the dangers of the millisecond and the multimillennium*—require a postnational, transhuman view of the future. Indeed, the reliance on nuclear materials that remain deadly for hundreds of thousands of years immediately troubles a national-cultural perspective, as these dangers long exceed any reasonable assumption about the lifetime of the nation-state. Nuclear materials not only disrupt the experience of nation-time (confounding notions of both the present and the future),

they also upset the concept of nation-space, in that they demonstrate the permeability, even irrelevance, of national borders to nuclear technologies (to intercontinental missiles and radioactive fallout, for example). The first thing that nuclear technologies explode, then, are experiences of time, undermining the logics of the nation-state by simultaneously enabling both the absolute end of time and the exponential proliferation of a toxic future.

Though caught in the interstitial space between present and future, while exceeding both the global and the local, nuclear weapons nonetheless have very exacting physical and cultural effects. A close analysis of where nuclear projects are situated and how they are executed ultimately reveals a hidden aspect of the nuclear age, namely, the nuclear state's equation of citizenship. For the entire production cycle for a nuclear weapon—from uranium mining, to plutonium production, to weapons testing, to nuclear waste storage—produces human and environmental costs that are borne by particular bodies in particular places. The social contexts informing nuclear projects therefore necessarily evoke questions about historical presence and identity, often of race and rights, always of citizenship and sacrifice. How individuals engage the nuclear complex puts them in a tactile experience not only with the technology of the bomb but also with the nation-state that controls it, making the interrelationship between the human body and nuclear technologies a powerful site of intersection in which to explore questions of national belonging, justice, and everyday life.

We might now ask: What does it mean when the "state of emergency" has *so explicitly* become the rule, when in order to prevent an apocalypse the governmental apparatus has prepared so meticulously to achieve it? What are the cross-cultural effects of living in an age when "mutual assured destruction" is a normalized, all but invisible, fact of life, a technological fix to the proliferation of nuclear weapons that makes the everyday intricately caught up in the negotiation of an imagined, and possibly real, end? How have tactile experiences of the world evolved cross-culturally in response to the growth of the nuclear complex, the spread of nuclear materials, and the cognitive remapping of time and space? What might be the social consequences of living in a world where the everyday has been so thoroughly colonized by the possibility of annihilation that, for most, it has become simply banal? Finally, if in fact people can be so anesthetized by the possibility of extinction that it no longer seems to register, how do we now regain our senses in order to even begin to answer such questions?

If we were to forward a specific historical moment in which nuclear weapons first showed signs of becoming normalized in the American

imagination, we might choose Operation Crossroads in 1946. Operation Crossroads was a series of nuclear tests performed by Los Alamos Science Laboratory at Bikini Island in the Marshall Islands. Newsreels from the time show Los Alamos scientists preparing for the detonation, which was designed both to sink the collected remnants of the German, Japanese, and American navies and to explore the effects of a nuclear explosion on everything from animals (goats, pigs, mice, guinea pigs—5,664 in all), to ships (nearly 100), to the ocean itself in order to further understand how to use nuclear weapons in war (Weisgall 1994: 120). In the black-and-white film footage that remains, Vice Admiral Blandy, who directed the tests, takes time to calm public fears: *No, the bomb will not start a chain reaction in the water converting it all to gas and letting all the ships on all the oceans drop down to the bottom. No, the bomb will not blow out the bottom of the sea letting all the water run down the hole. No, the bomb will not destroy gravity*.[12] Here, we see how the first non-wartime public encounter with the bomb provoked a monstrous imagination, a new kind of apocalyptic sensibility. Scientists at Los Alamos preparing for the Trinity test had negotiated a similar imaginary, wondering for a time if a nuclear explosion might not ignite the atmosphere, rendering the earth lifeless, a burnt cinder (Rhodes 1986; Szasz 1984). At Bikini, the first bomb was dropped off-target, leaving many of the ships intact. The second bomb was detonated underwater, destroying the armada and coating the region with dangerous levels of radioactivity.[13] But in many ways the awesomeness of the bomb failed the awesomeness of the American imagination in these highly publicized tests, allowing the first step toward the normalization of the nuclear age—for the world did not come to an end, the ocean and gravity endured. Soon to be recaptured by an elaborate system of government secrecy, the public debate that followed Operation Crossroads was quickly subverted by the start of the Cold War, beginning an oscillation in an American national culture between imagining the nuclear arsenal as the ultimate terror (simultaneously referencing America's vulnerability and its global insurgency) or dismissing it as an utterly banal fact of life, one not worth considering.

In this light, Gertude Stein's (1947) statement on the bomb foreshadows one powerful strand of American thought:

> They asked me what I thought of the atomic bomb. I said I had not been able to take any interest in it . . . What is the use, if they are really as destructive as all that there is nothing left . . . If they are not as destructive as all that then they are just a little more or less destructive than other things . . . I never could take any interest in the atomic bomb, I just couldn't any more than in everybody's secret weapon. That it has to be secret makes it dull and

> meaningless. Sure it will destroy a lot and kill a lot, but it's the living that are interesting not the way of killing them, because if there were not a lot left living how could there be any interest in destruction . . . There is so much to be scared of so what is the use of bothering to be scared, and if you are not scared the atomic bomb is not interesting. Everybody gets so much information all day long that they lose their common sense. They listen so much that they forget to be natural. This is a nice story.

If you are not scared the atomic bomb is not interesting. Here, Stein seizes on the apocalypticism of the bomb not to mobilize for or against the nuclear complex but simply to banalize it. Because the bomb is caught up in an imagined end, it becomes simply irrelevant for Stein, one among too many dangerous things to worry about in everyday life. We can see in her explanation the constellation of positions (the dismissal of national security rhetoric, the expected psychic release of an apocalyptic end, and the problematic negotiation of risk in modern life) that enables the bomb to be irrelevant to her, even as others came to feel utterly colonized by it. The power of Stein's statement is that it seems to reveal the failure of the national-security state to control the national imaginary. For Stein, nuclear war is not the "unthinkable," and thus embedded in the nuclear sublime, it is simply irrelevant, a bore.

But if, as Stein argues, the bomb is banal, how did it come to be so? For surely, a national project that has required so enormous a scientific, industrial, and economic sacrifice, and that is intricately involved in defining "security" for every citizen should evoke some feeling of belonging or at least of engagement. What Stein reveals is that public discourse about the bomb is always doubled: simultaneously terrifying and banal. Consequently, it prevents thought through either an anesthesia effect or overstimulation. Both of these attitudes reveal the cognitive impossibility of thinking past the remainderless event, of thinking through the nuclear apocalypse (see Derrida 1984). The notion of technological progress enabling the nuclear complex participates in a modernity that systematically denies this cognitive effect. This type of modernism encourages people to approach the invention of new technology as an inevitable part of an evolving natural world, and not as a cultural product that requires everyday decisions and infrastructural support and that produces profound cultural contradictions at the level of everyday life. In other words, nuclear modernism transforms a cultural invention into an unchanging aspect of a world system, making the other worlds that might still be invented inaccessible and installing a limit to thought at the center of the national security project. In this regard, Stein is more deeply embedded in the nuclear age than she allows. For her statement simply inverts the dominant logic of the U.S. nuclear complex, reducing the

bomb to irrelevance while others elevate it into the sublime. The banality of the bomb becomes merely one counterdiscursive effect of an institutional structure that is always preparing for the "unthinkable."

Nevertheless, the utopian potential and traumatic effects of the nuclear project continue to shape American imaginations. The phantasmagoria of nuclear war leads some to find anesthetic-comfort in a privatized everyday space, while encouraging others to find it, not through a psychic withdrawal and disinvestment, but through the flooding of the senses offered by participation in an all-or-nothing cosmology. The term *phantasmagoria* derives from an early-nineteenth-century optical illusion in which magic lanterns were used to project spectral forms and ephemeral beings in parlors and theaters for the amusement of a new middle class.[14] Benjamin found the phantasmagoria to be a powerful illustration of the new technosocial context of modern life, in which a fascination with artificial environments was making access to the real problematic. Here, Susan Buck- Morss identifies the political import of the phantasmagoria as an expansive new social form:

> Phantasmagorias are a technoaesthetics. The perceptions they provide are "real" enough—their impact upon the senses and nerves is still "natural" from a neurophysical point of view. But their social function is in each case compensatory. The goal is manipulation of the synaesthetic system by control of environmental stimuli. It has the effect of anaesthetizing the organism, not through numbing, but through flooding the senses. These simulated sensoria alter consciousness, much like a drug, but they do so through sensory distraction rather than chemical alteration, and—most significantly—their effects are experienced collectively rather than individually. Everyone sees the same altered world, experiences the same total environment. As a result, unlike with drugs, the phantasmagoria assumes the position of objective fact. Whereas drug addicts confront a society that challenges the reality of their altered perception, the intoxication of phantasmagoria itself becomes the social norm. Sensory addiction to a compensatory reality become a means of social control. (1992: 22–23)

Approaching nuclear war as a national phantasmagoria allows us to see its social effects without reducing its claim on the real. As Buck-Morss notes, the bodily effects of a phantasmagoria are as real as anything else—they engage the nervous system through tactile stimuli—but as a kind of mass hallucination, they also enable new kinds of social control. Thus, nuclear weapons do not have to be detonated to have profound cultural effects. Indeed, one illustration of the social control enabled by the phantasmagoria of nuclear war is a general inability to see the effects of the nuclear complex itself on everyday life. The hypnotic focus on nuclear annihilation during the Cold War provided a sensory distraction in the

United States, one that displaced the everyday consequences of life within a nuclear economy.

For Cold Warriors, the phantasmagoria of nuclear conflict provoked an imagination that was prolific, resolutely conjuring up, and then institutionally preparing for, the very worst: here one might point to the constant overestimation of the nature of the Soviet nuclear threat by U.S. government officials (i.e., the "bomber gaps" of the 1950s and the "missile gaps" of the 1960s and 1980s; see York 1970). In an imaginative economy of terror, the hyperstimulation of the psyche offered by the possibility of annihilation can only be maintained by expanding the degree of threat; hence, the constant acceleration and improvement in the means of destruction far beyond what was useful for a nuclear deterrent. This can also be seen in American Cold War projects that were less central but perhaps more clearly reveal the totalizing scope of the national security mind-set. Take, for instance, the twenty-four-year, multimillion-dollar CIA investigation into the military uses of psychics, an energetic response to signs of Soviet interest in the paranormal.[15] Here, the imaginative economy of the Cold War is revealed to operate not only at the level of military-industrial technology but also in, perhaps, its truer register, the technology of the mind itself. For just as psychics purport to know the future and to make manifest their desires directly through mental prowess, so too did the apocalyptic mirror-imaging between national security states enable Cold Warriors on each side to see their own worst fears manifested in the other, allowing a constant escalation and acceleration of risk. We begin to see here how a global circuit of imaginative exchange supported the Cold War nuclear economy, a psychically charged space of desire and expectation allowing Cold Warriors in the United States and the Soviet Union to "identify" a world of constantly expanding technological terror—a *nuclear phantasmagoria*—and then set about making that world manifest through a process of international mirror-imaging, misrecognition, and technophilia.

While the nuclear phantasmagoria was undoubtedly instrumental in consolidating certain national projects in the United States during the Cold War,[16] one unexpected development is the ease with which citizens now turn an apocalyptic imagination on the government itself, engendering in the post–Cold War period what some have called a "paranoid public sphere," where a kind of "ambient fear" and conspiratorial subtext seems to inform much of public life.[17] The Manhattan Project, in fact, now exists for many citizens as a prototype for a kind of secretive governmentality taken to be axiomatic of modern life, one in which world-changing national projects are only visible in their permanent effects. A suspicion that a secret master-narrative is operating beneath the surface of everyday life is an important Cold War after-image in the

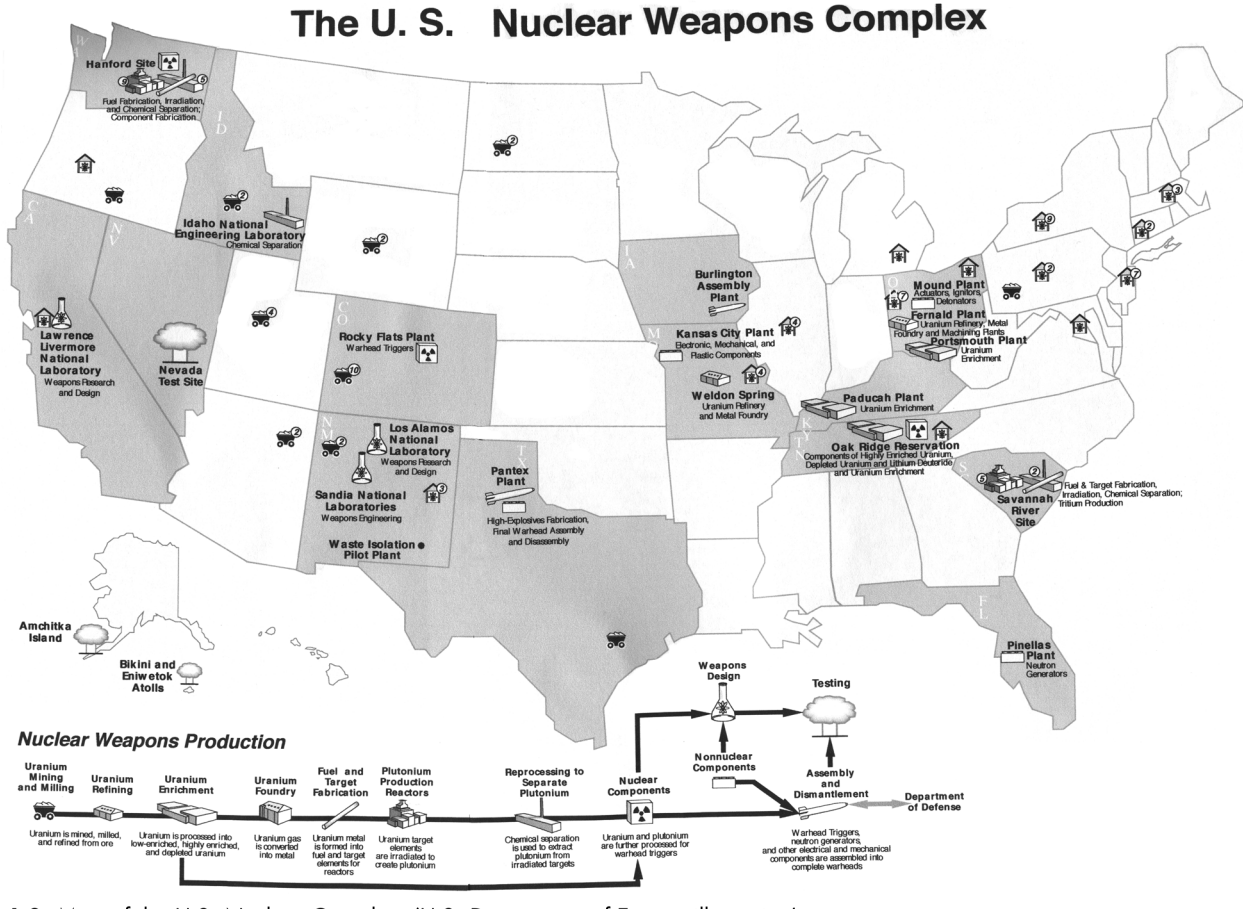
United States, one that now informs how many citizens engage (or disengage from) their government. For the post–Cold War period has brought forth a series of revelations about the kinds of national sacrifices that U.S. citizens were unwittingly subjected to in the name of "national security" during the Cold War. Revelations about environmental contamination of an unprecedented magnitude, of secret plutonium experiments on citizens, of atmospheric releases of nuclear materials to test fallout patterns over the United States, have all problemitized the purity of the Cold War narrative about the "security" enabled by the nuclear complex. We might now interrogate how the overstimulation of the body produced by an all-or-nothing Cold War cosmology, in which the world was always only minutes away from total annihilation, has mutated; how an addiction to the drama of everyday life in the Cold War—the flooding of the senses enabled by the nuclear phantasmagoria—could be unmoored, transforming into something else, in which the government as readily plays the villain. In any case, the U.S. nuclear complex can only appear to be banal because an enormous national-cultural project has worked to make it so, transforming human senses while deflecting attention away from the multitudinous effects of a nuclear economy on everyday lives. These effects have nothing to do with geopolitical strategy as traditionally conceived, or necessarily with a global apocalypse, but have everything to do with how individuals experience a national and a global sphere, in the context of a lived, localized existence.

Thus, contra Stein, the bomb is not interesting merely because it can be destructive, even if cataclysmically so. It is interesting because it is a *national fetish*, indeed perhaps *the* national fetish of our time. The bomb is not important simply because it offers the possibility of global destruction, but because it requires a nuclear economy to build it, one that has created new experiences of time and space, and that has produced cultural and environmental effects we have yet to account for. The apocalypticism and government secrecy supporting the bomb during the Cold War made it difficult to see the bomb as a social institution, with wide-ranging cultural, environmental, and psychosocial, as well as geostrategic effects. In the post–Cold War period, and really for the first time, we can examine the material and cultural effects of living within a nuclear economy, recognizing both its global impact and its local specificities. But to do so, we need to approach the nuclear complex as a material cosmological statement, in whose nature we can read a constellation of issues concerning technoscience, militarism, and security to be sure, but in which we can also see the terms of national belonging articulated and explore how individuals experience the tactile nature of everyday life. As American reactions to the terrorist attacks on September 11, 2001, clearly demonstrate, the unthinkability of the nuclear

age as a discursive practice works to keep a cultural space open, one available for oppositional nation-building through a mobile production of threat. As we shall see, however, "danger" now circulates within a national-cultural space that is also highly mutable, allowing the production of new articulations of "security" and "risk" to readily challenge those produced by the state. The task that remains is to identify the circuits of exchange produced by the U.S. nuclear economy, circuits that engage new articulations of the global and the local but that also expose the tense relationships between regional and national cultures within a sphere of both imagined and material risk.

RADIOACTIVE NATION-BUILDING

At the start of the Manhattan Project, physicist Niels Bohr quipped that it would take turning America into a factory to make enough plutonium to create a nuclear bomb (quoted in DOE 1995c: 2). A half century later America not only proved him right, it turned a project-specific nuclear economy in 1943 into a major national infrastructure (see Figure 1.2). Nuclear weapons remain to this day the preeminent *national* product of the twentieth century, and one of America's leading industries. Between 1940 and 1996 the United States spent over $5.8 trillion to construct seventy thousand nuclear weapons, making the U.S. nuclear arsenal one of the largest industrial enterprises in history (Schwartz 1998). During this time, the United States conducted a total of 1,149 nuclear detonations, the majority of them—942 to be precise—within the continental United States.[18] U.S. nuclear programs now inhabit a total landmass of over 36,000 square miles, larger than the combined states of Massachusetts, New Hampshire, Vermont, Maryland, and the District of Columbia (ibid.). The environmental contamination produced by the Cold War nuclear complex will take a financial and scientific commitment exceeding that of the original Manhattan Project to clean up those sites that can be cleaned up and to stabilize those that are already recognized as national sacrifice zones.[19] The nuclear waste and environmental contamination left from the Cold War, in fact, pose a new kind of threat to the nation, one that will continue generating danger for the hundreds of thousands of years it will take for radioactive materials to decay into less volatile forms. This is one illustration of the new global-local dynamic evoked by the nuclear arsenal—a trade-off between the security offered by a nuclear deterrent in a world of competing nation-states, the domestic consequences of environmental contamination, and the global effects of a nuclear economy dependent on foreign others to maintain its internal stability.



1.2. Map of the U.S. Nuclear Complex. (U.S. Department of Energy illustration)

Still, if one were to ignore the social and environmental consequences associated with the Cold War nuclear complex, then the U.S. nuclear economy might be a highly efficient means for distributing resources throughout American society. Americans from all races, classes, genders, and regions of the country have participated in the production of the U.S. nuclear arsenal. Even in a post–Cold War world, after the United States has provisionally supported a Comprehensive Test Ban Treaty (signed by President Clinton in 1996 but voted down by the Senate in 2000), begun dismantling thousands of weapons, and closed down some of its nuclear production complex, the United States continues to spend over $6 billion a year at the three national laboratories on nuclear weapons science.[20] This $6 billion is actually greater than what Los Alamos, Sandia, and Livermore National Laboratories averaged for nuclear weapons programs during the Cold War (about $3.7 billion; see Schwartz 1998). This money is devoted, however, not to designing, building, and testing new weapons, as it was from 1943 to 1992, but to maintaining nuclear expertise, upgrading the nuclear arsenal, and watching (through an array of new, state-of-the-art technologies) Cold War-era bombs age.[21]

To describe nuclear weapons as the national fetish par excellence is not to be facetious. For over fifty years, the United States has privileged nuclear weapons above all other federal programs, declaring the nuclear arsenal to be of "supreme national interest."[22] When the Berlin Wall came down in 1989, the United States had over 22,000 nuclear weapons deployed around the world; the Soviet Union had over 40,000.[23] Given that the simultaneous detonation of a few thousand weapons might produce a "nuclear winter" effect, severely changing the global climate and potentially bringing on a radioactive ice age, the extravagance of the nuclear arsenal begs a number of questions that have nothing to do with nuclear deterrence.[24] If we approach the nuclear arsenal as a tool for mobilizing a national-cultural imaginary, then we begin to see how the nuclear complex has become a cultural as well as industrial infrastructure. The mobilization of the phantasmagoria of nuclear war as a means of building up a military-industrial infrastructure (from the hydrogen bomb to President Reagan's Strategic Defense Initiative) is well documented, and need not be revisited here (e.g., see FitzGerald 2000; Rhodes 1995; Broad 1992; York 1970). From a cultural point of view, however, an equally important moment in the development of the bomb as national fetish is found in the career trajectory of Robert Oppenheimer, the physicist who directed Los Alamos during the Manhattan Project and who helped define America's immediate postwar nuclear policy. In the American culture of the late 1940s and 1950s, Oppenheimer was perhaps the most prominent public authority on nuclear weapons, serving as a veritable symbol of the

"nuclear age" itself. His resistance to building the hydrogen bomb led the Atomic Energy Commission (AEC) to censure him publicly in 1954, resulting in the loss of his security clearance and his expulsion from the arena of nuclear strategists (see Herken 2002). The Oppenheimer trial reinforced a split inherent in the initial organization of the Manhattan Project between a professional nuclear culture of scientists and strategists and the larger American public sphere; the trial provided a national spectacle, demonstrating to all that the Cold War nuclear complex was not only going to be rigorously protected from public debate, but that even those who inhabited its highest levels would be readily sacrificed to the bomb as national fetish (see AEC 1971, as well as Rhodes 1995: 530–59).

But what does it mean to say that nuclear weapons are a "national fetish"? As material objects nuclear weapons occupy a peculiar position in the world system. In his discussion of commodity fetishism, Marx describes the commodity as a "social hieroglyphic" in which a "definite social relation between men . . . assumes, in their eyes, the fantastic form of a relation between things" (1967: 77). I have been arguing thus far that the phantasmagoria of nuclear war allowed an apocalyptic focus on weapons to preempt attention to the everyday social and material effects of the U.S. nuclear production complex. One can also certainly see in the Cold War logics of nuclear deterrence a fetishizing of nuclear technology: Los Alamos and Livermore designed over sixty-five different nuclear weapons systems during the Cold War, each to perform a specific military purpose, and the weapons laboratories in the Soviet Union produced a similarly versatile arsenal. In fact, both countries invested in a technological mirror imaging of each other through nuclear weapons, as each new weapons system was met by a corresponding new technological development on the other side. Thus, we might say that, during the Cold War, the technofetishistic appeal of nuclear weapons enabled a social relation between nations to be mystified as a strategic orientation between machines.

However, before pushing Marx's insight too far, we must ask: Are nuclear weapons actually commodities? A commodity is, in Marx's view, an object in which use value and labor value are erased by social investment in a system of exchange value; that is, all commodities can be converted into their "equivalent worth" in terms of money. While it has taken a multitrillion-dollar economy to produce the U.S. nuclear arsenal, in which nearly every component of the bomb—from microchips to underground nuclear test cables to surveillance satellites—is commodified to some degree, the bomb itself had only one consumer in the twentieth century, the nation-state. Moreover, the bomb as object has never been convertible into a cash relation to other commodities, and it does not circulate among other commodities. Nuclear weapons are national projects in which the normal

rules of economic exchange are suspended under the sign of "national security." Since 1945, the United States has determined what its nuclear needs are independent of market logics and regardless of economic expenditure. But if labor value is erased in the bomb as national fetish, and it does not circulate as a commodity among other commodities, what then of its use value? Nuclear weapons are, paradoxically, designed never to be used. Their "use value" is as a deterrent to international conflict, not as weapons to be used in a war that remains "unthinkable." Nuclear weapons are therefore a technoaesthetic whose primary importance in the global order is one of appearance. In other words, while it is important for other nation-states to believe the U.S. nuclear arsenal is viable, it need not actually be so to provide a military deterrent. Thus, nuclear weapons present a bizarre and hyperfetishized material logic, one that confounds the standard logic of commodities, and suggests the arrival of a new social form.

But if the bomb is not a commodity, in the traditional sense, then what is it? I say it is a *national fetish* because it takes a nation-state to build and maintain it, and because the international hierarchy of nation-states is mediated through possession of the bomb. Nuclear weapons therefore maintain a magical hold on people's thinking, and in doing so, energize very specific national-cultural imaginaries. As Ann McClintock (1995: 184) explains it, the fetish:

> stands at the crossroads of psychoanalysis and social history, inhabiting the threshold of both personal and historical memory. The fetish marks a crisis in social meaning as the embodiment of an impossible irresolution. The contradiction is displaced onto and embodied in the fetish objects, which is thus destined to recur with compulsive repetition. Hence the apparent power of the fetish to enchant the fetishists. By displacing power onto the fetish, then manipulating the fetish, the individual gains symbolic control over what might otherwise be terrifying ambiguities. For this reason, the fetish can be called an impassioned object.

Nuclear weapons, as "impassioned objects," are not only the material products of complicated linkages between government, military, and scientific communities but are also national-cultural sites of fetishistic projection. Positioned as the "supreme" object of national power and fascination since 1945, nuclear weapons are imbued with all the contradictions of the nation itself. Each nuclear weapon in the U.S. arsenal presents a site of national cultural fascination/contradiction because it carries displaced historic ambivalences about violence, alterity, and power in a democracy. As industrial infrastructure and national fetish, the bomb links all domains of American society and provides powerful modes of circulation. Indeed, the bomb presents a strange new articulation of what Marcel Mauss (1990) called a "total prestation," an object

of exchange that engages all social institutions—economic, political, religious, and sociocultural. For example, building the U.S. nuclear arsenal required unprecedented coordination between military, industrial, academic, and legislative sectors of American society. LANL is part of the Department of Energy (DOE) but managed by the University of California, and maintains a complex set of relations with each branch of the U.S. military as well as corporations and industrial suppliers. A map of the institutions involved in the production of any U.S. nuclear device is a map of the significant political, industrial, academic, and scientific relationships in American society.

During the Cold War, nuclear weapons also participated in a perverse international gift economy, in which the development of a new nuclear device was an invitation for greater and greater military expenditures on each side. Take, for example, the sixteen-month period between September 1961 and December 1962, when the United States and the Soviet Union engaged in an entirely new type of global exchange—detonating well over two hundred nuclear bombs in rapid succession at their respective test sites (averaging three a week).[25] Here the earth itself was used to convey the gift, as the tectonic impacts of each nuclear detonation carried the message of national prowess through the earth's crust to the hundreds of seismic monitoring outposts each country had set up around the world for just such a purpose.[26] Within the circuits of international exchange supporting the Cold War, each detonation required a response. The proliferation of testing during this period (which included the building of the Berlin Wall and the Cuban Missile Crisis) was not merely the rush to verify new weapons designs before an above-ground test moratorium took effect, it was also calculated to display nuclear surplus at a time of heightened Cold War tension, as each side detonated dozens of bombs to send the simple message that they could afford to.

The *intimate* power of this Cold War nuclear gift economy is not often recognized, which is another effect of the bomb as national fetish. It does, however, reveal itself in one of the first acts of the post–Cold War era in Los Alamos; namely, an energetic effort by LANL weapons scientists to meet with their counterparts in Arzamas-16, the Russian nuclear weapons laboratory (see Figure 1.3; and also LANL 1996a). Here, the forty-odd-year struggle between Cold War weapons scientists quickly dissolved into a proliferation of concern by Los Alamos weapon scientists for the fate of their Russian counterparts in a rapidly disintegrating political situation. This unprecedented dialogue generated new joint research projects, a sharing of technology on how to monitor the nuclear arsenal in Russia, as well as cash support for Russian weapons scientists all but abandoned by the Russian state. These conversations revealed that,

1.3. Directors of the U.S. and Russian nuclear weapons laboratories meet in Cheyabinsk-70, Russia, in 1992. (Courtesy of Los Alamos National Laboratory)

while absolutely separated by national affiliation, the American and Russian weapons designers were perhaps more closely linked in techno-scientific culture and worldview than any two such communities on earth. If this seems at odds with the Cold War presumption that each had been devoted to devising ever more powerful and elegant means of destroying the other, it is because we have yet to acknowledge the psychological intimacy of the U.S.-Soviet relationship during the Cold War. By 1995, however, Los Alamos residents who had spent two generations "at war" with the Soviets were investing in clothing, food, and medicine drives for the citizens of their new official "sister city"—Arzamas-16 (now restored to its pre-Soviet name, Sarov).

The strange new intimacy of life in the nuclear age is often overlooked. Partly this is drawn from the ways in which nuclear technologies come to restructure how people experience the world, their positioning in time and space. But it is also drawn from how ubiquitous the nuclear complex has become, from how many unacknowledged aspects of everyday life are connected in some way to the national fetish. The industrial base needed

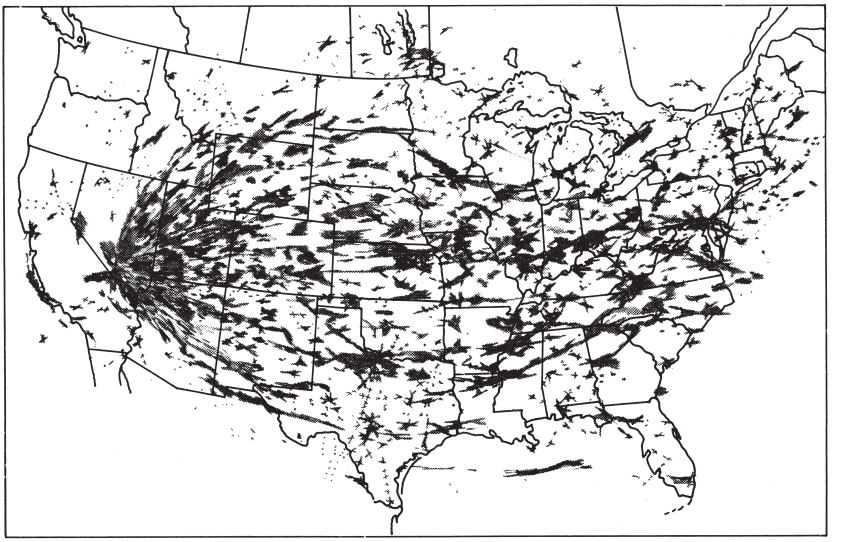
to create plutonium, to design and test bombs, and to monitor the earth for signs of nuclear proliferation has produced an array of new technologies now seamlessly interwoven into everyday life. The interstate highway system, for example, was created by President Eisenhower in 1956 explicitly as a means of evacuating cities in the case of a nuclear war (Winkler 1993: 117). The Federal Emergency Management Agency (FEMA), now deployed predominantly to advise citizens during natural disasters, originated in Cold War nuclear civil defense planning, when the sirens signaled not hurricanes and floods but Soviet missiles and bombers. These are but the most apparent everyday nuclear infrastructures because they are linked directly to civil defense. However, technological advances in supercomputing, lasers, and satellite telecommunications are also directly tied to, on the one hand, the scientific need to understand what happens in a nuclear explosion, and on the other, the need to maintain communications in the midst of a nuclear war. Microelectronics, plastics, new technologies of global surveillance (seismic, atmospheric, and geo-orbital), computer memory, modems, color photographic film, as well as the Internet all have lineages deriving from the nuclear weapons programs. As Paul Edwards (1996) has powerfully argued, the minute-to-minute threat of nuclear war produced a totalizing vision of American technology during the Cold War, a "closed world" of early warning systems and military technology linked by always-on computers, encompassing the earth in an always expanding technoscientific form of American power. As the central American project of the twentieth century, the technological infrastructures supporting the nuclear arsenal have come to define everyday American life in ways both subtle and far reaching: put simply, America in the twenty-first century remains a society built around, and to a large extent, through the bomb.

The unprecedented national resources devoted to the bomb, its infrastructural role in everyday life, and the cross-section of American society working within the nuclear complex make the bomb an example of what I call *radioactive nation-building*. I mean this to operate in both a literal and a figurative register. For the huge national security projects of the nuclear age created new technologies for everyday life, just as the new apocalyptic possibilities that energized them colonized national imaginaries and changed relationships between citizens and the state. Nation-building projects that pursue the public good through means that are simultaneously corrosive of the social contract are, in a sense, always "radioactive," because they contaminate the public sphere, invading bodies and disrupting cosmologies in ways that promise to mutate over time. In this sense, the nuclear age has always been culturally toxic, but it is only after the Cold War that the long-term effects are becoming visible. With each new revelation of covert human plutonium experiments,

public misinformation campaigns, or environmental contamination, the state's ability to define security in a meaningful way is further compromised, engendering a paranoid public sphere. Radioactive nation-building involves, therefore, not only the past practices of the U.S. nuclear complex performed in the name of Cold War national security, but also the collective, future-oriented national cultures it engenders.

Indeed, the legacies of a half century of radioactive nation-building are not only in our technological infrastructure and our social institutions—they are in our bodies. Every person on the planet now receives a certain amount of radiation each day produced by the cumulative effects of above-ground nuclear weapons tests and radioactive releases from within the global nuclear complex. Most of us have some level of radioactive toxins in our bodies directly derived from the U.S. nuclear complex. As the cumulative radioactive fallout trajectories from the era of above-ground nuclear tests in the United States testify, none have been immune (see Figure 1.4). The National Cancer Institute (NCI) now estimates that if you were alive in the United States between 1945 and 1963 you received at least two rads of iodine-131 (a radioactive isotope that can produce thyroid cancer) from U.S. nuclear testing.[27] If you were a child living in the western states who liked to drink milk you quite likely received more, perhaps eight times as much (as proximity to the Nevada Test Site, combined with tendency of iodine-131 to concentrate in animals that graze, put children at greatest risk). The NCI estimates that between ten thousand and seventy thousand people (most of whom were children at the time of above-ground testing) will develop thyroid cancer over the course of their lifetime as a result of nuclear testing. It should be underscored here that iodine-131 is but one of a number of radioactive toxins distributed by atmospheric fallout—including plutonium-239, strontium-90, and cesium-137—that can produce dangerous or deadly health effects (see IPPNW and IEER 1991).

Thus, all Americans participate in the nuclear complex, whether they realize it or not. In this sense, the Manhattan Project inaugurated what Ulrich Beck (1972) would call a "risk society," a new modernity in which dangers produced by the nation-state can no longer be controlled by it or be contained within its borders. The nuclear fallout from the 1986 Chernobyl accident in the Ukraine, for example, not only severely irradiated northern Europe and Greece but also was found in the water supply of Portland, Oregon—halfway around the world. This kind of transnational risk obliterates the possibility of a specifically "national" security, and places what Adriana Petryna (2002) has called "partial knowledge" at the center of a new social contract between citizens and the state over the terms of health, scientific knowledge, and governmentality. The



1.4. Cumulative U.S. fallout trajectory map. (*Source: Under the Cloud: The Decades of Nuclear Testing,* Courtesy of Richard L. Miller)

international nuclear complex is estimated to have already produced over four hundred thousand cancer deaths worldwide simply from the dispersion of radioactive materials into the environment (IPPNW and IEER 1991). It also has consistently targeted minority communities for the most dangerous nuclear projects, creating a new form of global environmental discrimination some have called "radioactive colonialism" (Churchill 1997; see also Kuletz 1998). Put differently, even as the sole remaining superpower, the United States is also the most nuclear-bombed country in world, having detonated nearly one thousand nuclear devices within its own territorial borders. The social anesthesia required to insulate the public from the combined social and biological effects of the nuclear complex adds a new dimension to our previous discussion of the "nuclear state of emergency" and illustrates once again the ferocious investment in the nuclear arsenal as American fetish. Now, however, it is important to look more closely at how radioactive nation-building over the past half century has engendered new tactile experiences of everyday life in the United States, and with them, new psychosocial realities.

THE NUCLEAR UNCANNY

The nuclear age has witnessed the apotheosis of the uncanny. During the Cold War this was most obviously manifested in the psychic anxieties produced by knowledge that less than thirty minutes were all that separated the

quotidian from annihilation, from living within a temporal space in which the missiles may have always already been launched. Fear of radioactive contamination has also colonized psychic spaces and profoundly shaped individual perceptions of the everyday from the start of the nuclear age, leaving people to wonder if invisible, life-threatening forces intrude upon daily life, bringing cancer, mutation, or death. The dislocation and anxiety produced by these moments of tense recognition is what I call the *nuclear uncanny*. The nuclear uncanny exists in the material effects, psychic tension, and sensory confusion produced by nuclear weapons and radioactive materials. It is a perceptual space caught between apocalyptic expectation and sensory fulfillment, a psychic effect produced, on the one hand, by living within the temporal ellipsis separating a nuclear attack and the actual end of the world, and on the other, by inhabiting an environmental space threatened by military-industrial radiation. We can see the nuclear uncanny manifested today in a variety of new forms, from new biological beings created by the effect of radiation on living cells, to new social formations brought together by the joint experience of risk and/or fear of contamination.[28] It is in the arena of the nuclear uncanny that the concept of "national security" becomes most disjointed, as citizens find themselves increasingly separated from their own senses and distrusting of their own surroundings due to an engagement with nuclear technologies. This "theft" of sensibility is a complicated phenomenon, enabled not only by the space/time contraction of thermonuclear missile technology, but also by the unique physical properties of nuclear materials, and in particular, the phenomenon of radiation.

In a now famous essay, Freud defined the uncanny (*das Unheimliche*—literally, the unhomely) as a psychic process whereby sensory experience becomes haunted and untrustworthy, a return of the repressed that reveals a secret desire to return "home." For Freud the uncanny consists of (1) a sudden loss (or distrust) of one's senses (often represented as a fear of being blinded), and (2) the psychic ambiguity produced by inanimate objects that appear to be alive. Describing the uncanny as a slippage whereby "the distinction between reality and the imagination is effaced," Freud identifies the uncanny in a number of social forms: automatons, ghosts, dead bodies, and doppelgangers. For him, the uncanny is that which blurs the distinction between the living and the dead, the hallucinatory and the real, and which, in essence, makes sensory experience untrustworthy and strange. This psychic slippage is, for Freud, always a return of something repressed, a repetition that ultimately is tied to castration anxiety and the urge to return to that ultimate experience of "home"—the womb. However, what makes the uncanny weird is that it is often informed by outmoded cultural forms, beliefs that are supposed to have fallen away in the age of industrial modernism. The supernatural aspects

of the uncanny are ultimately for Freud moments of cultural as well as psychic slippage, episodes where animistic beliefs colonize the modernist everyday, points of confusion where an industrial society wonders if ghosts might, in fact, still exist. The uncanny evokes fear, then, because it is an instant when modernist psychic and cultural structures become momentarily undone or out of joint, thus revealing the dangerous vulnerability of the human sensorium to an uncertain and uncertainly haunted universe.

Some moments of the nuclear age now resonate with all the accoutrements of the Victorian horror stories Freud based his reading of the uncanny on. Take, for example, Project Sunshine, a series of experiments conducted by the AEC in 1953. Run out of the University of Chicago, Columbia University, and the New York offices of the AEC, Project Sunshine was publicly marketed as an investigation into naturally occurring radiation, in which radiation doses to people were measured in "sunshine units" (a ploy to counter widespread public fear of radiation).[29] Project Sunshine was in reality, however, a classified project to find out how much strontium-90 had been introduced into the global environment as a result of above-ground nuclear explosions.[30] Its goal was to assess the genetic impact of atmospheric nuclear testing on individuals, to discover exactly how many nuclear explosions it might take to pose a threat to the genetic stability of the human species. To do so, scientists sought a worldwide sample of human teeth and bones to test for levels of strontium-90. The bones of infants were particularly desired, as children are more susceptible to nuclear materials (making young bones a better measure of strontium-90 distribution). "Sunshine" scientists therefore initiated a secretive global search for baby bones and entered into discussions about "bodysnatching" as a means of getting their samples. Then AEC commissioner Willard Libby, in a classified meeting on Project Sunshine in 1953, concluded: "So human samples are of prime importance and if anybody knows how to do a good job of body snatching they will really be serving their country."[31] *Bodysnatching, baby bones, genetic mutations, sunshine units*—these are the terms of a new American modernity based not only on technoscience but on managing the appearance of the bomb.

Project Sunshine can be read as an official articulation of nuclear fear, a tacit recognition that a new tactile experience of the world was being created by the distribution of nuclear materials into the environment. Like the early nuclear flashblindness experiments, however, it was intended not to prevent the introduction of nuclear materials into the world—to stop the trauma of potential genetic mutation—but rather to measure the effects of nuclear technologies on the human body in a world already committed to a nuclear arms race. A decade later, when the Atmospheric Test Ban Treaty

was signed (1963), the earth was explicitly incorporated into the nuclear complex as a means of insulating people from the effects of fallout.[32] The submersion of bomb testing produced a number of psychic effects worldwide: on the one hand, contributing to the banalization of a bomb that no longer had dramatically visible effects (the mushroom cloud), but on the other, allowing nuclear fear to become more mobile as the invisibility of nuclear contamination engaged new psychic and cultural registers in a global, Cold War nuclear complex. I want now to examine two specific aspects of the nuclear uncanny. The first has to do with the cognitive effects produced by nuclear materials; that is, how a tactile engagement with the world can be effected by the sensory-disorientation produced by the phenomenon of radiation. The second has to do with a special type of repression located in the nuclear uncanny, one that, because it is drawn from an engagement with the national fetish, necessarily involves national-cultural as well as psychosocial registers.

Nuclear materials are sources of invisible power. Radiation is colorless and odorless, yet capable of affecting living beings at the genetic level. In this sense, nuclear materials produce the uncanny effect of blurring the distinction between the animate and the inanimate, and between the natural and the supernatural. For example, the plutonium pit that fuels a nuclear weapon might feel warm to the touch but such warmth is completely at odds with the enormous power it represents (see Figure 1.5). It took only one gram of a sphere of plutonium-239 to produce enough energy to destroy the city of Nagasaki in 1945 (McPhee 1974: 163). Plutonium is as uncanny a material as can be imagined: from a molecular perspective, it has six different crystalline structures existing at ambient pressures; this allows it to change radically in density with the slightest shift in its unstable atomic structure. Heat plutonium in some of its phases and it shrinks; in others, it can ignite on contact with oxygen. Discovered in 1941, plutonium is all but nonexistent in nature, yet it now can be found in trace amounts everywhere on the planet as a result of atmospheric nuclear testing; and with a life span of 240,000 years, it is, from a human perspective, virtually eternal. Plutonium's value has always been its molecular instability, useful for fueling the atomic chain reaction that ignites a nuclear bomb, but highly problematic in its millennial essence. Not unlike a strange new life form, plutonium is always evolving, changing in appearance, threatening to explode. Here is how two senior weapons scientists at Los Alamos (Hecker and Martz 2000: 238) describe the problem presented by managing Cold War plutonium:

> Like other reactive materials, plutonium ages with time. In moist air, it "rusts" much more profusely than iron, and when exposed to other atmospheric

(continued...)

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