



**MONUMENTS AND MEMORY,
MADE AND UNMADE**

EDITED BY

ROBERT S. NELSON AND MARGARET OLIN

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Building a Marker of Nuclear Warning

JULIA BRYAN-WILSON

These structures mark an area used to bury radioactive wastes.

This place was chosen to put this dangerous material far away from people.

Do not drill here.

Do not dig here.

Do not do anything with the rocks or water in this area.

Do not destroy this marker.

This marking system has been designed to last 10,000 years.

Proposed text to be inscribed on stone monoliths
at the Waste Isolation Pilot Plant nuclear waste storage facility

On March 26, 1999, New Mexico's Waste Isolation Pilot Plant began storing used nuclear fuel and high-level radioactive transuranic waste from the U.S. nuclear weapons industry. Located in a rural area twenty-six miles east of Carlsbad, New Mexico, the Waste Isolation Pilot Plant, known as WIPP, is the only receptacle for transuranic waste in the United States, receiving shipments from more than twenty nuclear weapons plants around the country.¹ The waste, including sludge from spent nuclear fuel as well as gloves, hats, rags, and other radioactively contaminated tools, is packed into fifty-five-

gallon steel drums, then neatly stacked in cavernous chambers nearly half a mile underground. In the year 2030, when the storage facility reaches its maximum capacity after receiving more than thirty-seven thousand shipments, it will be permanently sealed. At that time, the transportation facilities and maintenance buildings now planted over the deep storage site will be shut down and dismantled, and its 850,000 barrels of radioactive waste are meant to sit undisturbed in perpetuity, embedded within the underground salt-rock formations of this arid southwest landscape.

Transuranic waste includes plutonium and neptunium, which are heavier elements than uranium and much more dangerous. These elements are lethal even if inhaled in minuscule doses and have astounding longevity: neptunium's half-life is approximately two million years. In addition, plutonium is a highly mobile particle which can leak into groundwater, be absorbed into underwater crevices, or form a high-pressure gas that can seep corrosive energies out onto the surface of the earth. Because these materials retain their toxic potential so far into the future, WIPP has taken extra precautions to ensure their inaccessibility and has assured critics that the salt walls will slowly creep inward, surrounding the barrels on all sides to create an impenetrable seal.

This is the first and only permanent deep geologic waste dump in the world, the single site where radioactive matter—which will continue to be lethal for over 200,000 years—is to be housed, secure, forever. Of course, forever is a long time, and the entire area could one day be flooded with water as it was centuries ago, or earthquakes could rock the region and disrupt the salt beds. Predicting what the earth will do for the next few hundred millennia necessitates the calculation of geologic, climatologic, seismic, volcanic, tectonic, and hydrologic probabilities.² The U.S. Department of Energy believes (and has promised, in its many reports to Congress during the twenty-year process of approval/construction of WIPP) that this site is geologically stable: there is negligible risk of earthquakes, volcanoes, or other breachable openings.³ Only human intervention, WIPP claims, could cause these matters to leach out from their engineered graveyard. Thus the Environmental Protection Agency's regulation 40 CFR Part 191 has mandated that the WIPP site maximize impenetrability against human encroachment for the next ten thousand years.⁴

Guessing what the earth might do in the next ten thousand years is one thing; guessing what *humans* will do over the next five hundred generations is its own special problem. The WIPP builders must account for the possibility of human intrusion into the underground chambers—drilling, mining, or excavating—until the year 12,030 A.D. The EPA, in an attempt to forecast how future populations will interact with this storage facility, has ordered a

highly visible marker to be placed over the dump, decreeing that "disposal sites shall be designated by the most permanent markers, records, and other passive institutional controls practicable to indicate the dangers of wastes and their locations."⁵

To prevent future generations from digging, inhabiting, or planting this poisoned terrain, a government-appointed team of anthropologists, linguists, archaeologists, and engineers is currently involved in fabricating a warning marker to be constructed over the vault once it is sealed in 2030.⁶ In a Department of Energy-sponsored workshop that took place in 1991, this team sketched out a series of preliminary designs and schematic plans for a marker. These plans form the basis for my investigation here. The team intends for the marker to survive the next ten millennia while continually broadcasting its message of danger with no slippage or decay of meaning. Here the stakes of "reading the visible" are urgent and bodily—genetic damage or death awaits those who misunderstand. How can existing iconographies convey this threat long past the projected decline of current semiotic systems? The marker must transmit its warning information to any and all future societies, whether illiterate or unthinkably technologically advanced.

Unable to predict how visual clues will be understood in the future, and certain that current languages will have long since faded into the arcane, the designers of the marker, referred to in official government documents as the Marker Panel, attempt to forge an architecture which will *permanently* signify the presence of danger. As the report states: "[A] major premise of our work is that the physical form of the entire WIPP and each of its structures can be communicated through a universal, 'natural language' of forms." This statement, with its totalizing pursuit of the universal, seems open to all kinds of academic derision, as it is made in the wake of decades-old debates about cultural specificity and the "period eye."⁸ Yet the Marker Panel takes this belief as their starting point and addresses the charge of developing a "universal language of forms" seriously, as if it were, indeed, a matter of life and death.

The panel put forth several options, all of which are currently under review: one will be chosen and built in approximately thirty years at the cost of millions of dollars.⁹ Sandia National Laboratory's three-hundred-page report *Expert Judgment on Markers to Deter Inadvertent Human Intrusion into High Level Waste Sites* emphasizes that the scale of this marker will be "colossal . . . equivalent to the pyramid complexes of Egypt."¹⁰ The simple placement of a low earthen wall around the boundary of the site (almost sixteen square miles) would require the excavation of twelve million cubic meters of earth: a gargantuan task involving incredible financial expenditure and labor power.¹¹

Thus this hazardous dump will sprout above it one of the biggest construction projects in history, and it will loom over the dry, scrubby landscape to be visible not only from a great distance but also, according to some plans, from space.

To speculate about how such a monumental topos will be deciphered in the centuries to come, the designers mined the past, locating historical icons of threat to find effective symbols of caution and repulsion. Seeking lessons about the mechanics of monumentality, the WIPP team studied archaeological evidence such as Stonehenge, the Great Wall of China, the Egyptian pyramids, and Peru's Nazca lines for design ideas. None of the historical precedents studied by the panel were devoted to devalued sites; the WIPP marker is unique because it will designate not a site of worship or worth but one of toxic, deadly garbage. Looking at highly guarded sacred sites and taboo regions, the panel concluded that the most permanent, visible, and durable marker would follow what they refer to as the Stonehenge model. Stonehenge, of course, does not prevent access to its site; rather, it has become a tourist mecca, and its power to draw thousands of visitors each year stands in sharp contradiction to the fundamentally prophylactic charge of the WIPP marker. Disregarding this major flaw in logic, the panel decrees that the marker will consist of megaliths from thirty to seventy feet in height, constructed of local, common, and valueless materials.¹² The preferred designs also emphasize a high level of redundancy; multiple monoliths increase the probability that some will remain if others are destroyed, damaged, or removed.

Many of the proposed marker designs utilize similar visible codes. "Landscape of Thorns" (fig. 8.1) consists of towering fields of jagged stone spikes littered on the land where the waste is buried.¹³ However, if the marker were only a vertical masonry monument, it would risk being read as honorific or commemorative; thus in "Landscape of Thorns" the danger is meant to be conveyed via an anti-artistic, anti-elegant, archaic style that belies both its careful investment in technology and the highly engineered waste dump beneath it. The thicket of thorns leans precariously, implying or threatening imminent catastrophe. Each rough, uneven stone, made of local basalt or granite, will weigh sixty tons or more, thus minimizing the likelihood that they will get carted off and used for other projects. Supplementing these megaliths will be a million buried glass or ceramic objects emblazoned with warnings seeding the entire area. These are but one element of an organized environment of signs, which includes a message kiosk, capsules scattered throughout the site, a buried information center, and an archive located elsewhere with detailed maps and scientific materials in many languages.

"Skull and Crossbones Used for Earthworks, at Closure and after 500 Years" follows a recommendation from Carl Sagan, the most illustrious expert

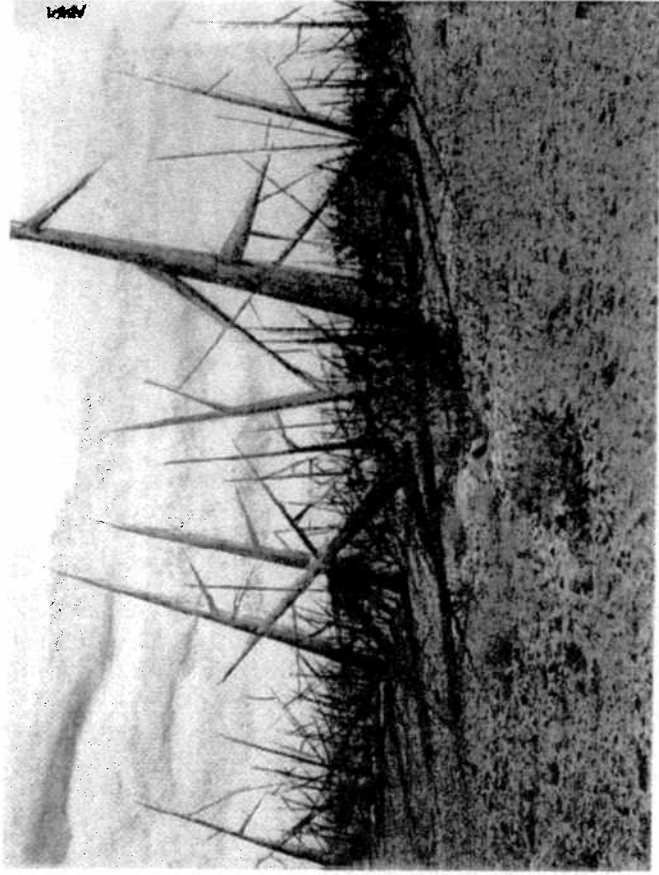


Fig. 8.1. "Landscape of Thorns, view 1." Concept by Michael Brill. Art by Safdar Abidi. Courtesy Estate of Michael Brill.

consulted.¹⁴ Two drawings in *Expert Judgment* show a large earthen skull-and-crossbones laid atop the waste storage area. One drawing shows it when first built, its hollow face rendered with neat lines; the other shows it five hundred years later, irrevocably disintegrated. Because it lies low to the ground and relies on a certain coherence of shape, it is subject to a far more rapid deterioration than the already-ruined look of the "Landscape of Thorns," whose sinister ruggedness would only increase with time. The forecasted decay of the formerly crisp outline well beyond the point of readability led the designers to veto the idea, for there will be no upkeep of these grounds after 2030 when the dump closes. (The EPA stipulates that the WIPP marker must signify on its own, passively, with no guards or maintenance staff.)¹⁵ "Skull and Crossbones" encapsulates many of the marker features the panel ultimately abandoned: a design which hugs, rather than juts from, the ground; a projected softening of form; and a reliance on an arbitrary sign that, although widely used today, has no inherent relation to the idea of radioactivity or danger. Despite Sagan's confident assertion that it is the "one tried and true . . . transcultural symbol with

unmistakable meaning,"¹⁶ in today's lexicon the skull and crossbones could as easily signify "pirates" as "poison."

Ultimately, a giant Mr. Yuk face in the desert or its equivalent was deemed insufficient given the malignant potency of nearly six million cubic feet of nuclear waste.¹⁷ The urgent message the panelists want to sound across the next five hundred generations—"KEEP OUT!"—is a speech act they hope is so powerful that it will continue to resonate despite the unforeseen evolution of both visual and verbal languages. The panel undertakes a semiotic task, then, which is no less than the permanent cementing of the signifier to the signified. In order to execute this task (an impossible post-Saussurian maneuver), the panel has recourse to the cultural symbolism of Carl Jung, operating from a logic of archetypes infused with an almost psychic, rather than cognitive, meaning. Struggling to come up with an ensemble of such symbols, the panel looks to what it sees as the "uncoded" sign systems of the human body.

The panel researched previous, more literal precedents for the "universalism" of the human figure, such as NASA's 1971 Pioneer spacecraft with its plaque of two naked humans, the man waving a greeting,¹⁸ and the more comprehensive 1977 Voyager space capsule meant to introduce aliens to the human race.¹⁹ (In fact, astronomer Frank Drake of UC-Santa Cruz was on the team that designed the Voyager spacecraft as well as the WIPP Marker Panel.) The panel decided that basic human physiognomy is one element of iconography unlikely to change and that physical gestures of repulsion and disgust are "cross-culturally unambiguous."²⁰ One proposed warning sign twins a crude sketch of Edvard Munch's *The Scream* with a drawing of a nauseated man from an anthropological textbook on facial features depicting the registration of disgust.²¹ Assuming a transparent and inert meaning for these faces, and with no consideration for how these faces might be very specifically raced, gendered, or otherwise freighted with meanings that might complicate the intended message, the committee relies on bodily gestures to provide the most basic level of information: the distressed expressions on the warning plaque indicate that something man-made, and dangerous, lurks beneath. For the panel, these faces have a fixed signification that transmits the idea of threat with a crystalline purity. Wrestling Munch's face from its painted context, they equate this art historical element with a diagram, hardening its interpretive ambiguity in an effort to turn art into science. However, these message plaques do not reach the level of imposing size deemed necessary, so the panel proposed incorporating them within more specialized message centers and inscribing them onto a series of megaliths. For the linchpin of this constellation of symbols—the central, stabilizing component that gives the warning system meaning—is the above-ground marker: it is this area that does the heaviest

work to either deter or attract visitors. The huge spikes, as well as the agonizing faces, are what will, it is hoped, refuse all curious eyes and bodies both from a distance and up close.

While massive earthen works have materially survived for several millennia and are found all over the world, their precise meaning or function often remains a matter of conjecture to us today; but the designers of the marker push for a foreboding, and physically colossal, plan, insisting that such a marker will be resistant to decay both from the natural elements and from the inevitable mutation of current symbology. The designers fantasize about something that can persist through any political, economic, or ecological change—and hence, they deduce, a certain amount of spectacularity is required. As one panelist put it, "[A] marker system should be chosen that instills awe, pride, and admiration, as it is these feelings that motivate people to maintain ancient markers, monuments, and buildings."²² Since any physical barrier erected could be eventually breached, the panel focuses instead on psychological, fear-instilling obstacles that express prohibition and inhibit interest.

In the "Black Hole" sketches (fig. 8.2), the area above the storage site is covered with dark, irregularly cracked and jagged asphalt. Here the designers marshal what they see as the inherent ugliness of the landscape itself as a de-



Fig. 8.2. "Black Hole." Concept by Michael Brill. Art by Safdar Abidi. Courtesy Estate of Michael Brill.

terrent. This proposal turns the hot desert into a patchwork black parking lot—surely a repellent structure if there ever was one. Its description reads: “[T]he heat of this black slab will generate substantial thermal movement. It should have thick expansion joints in a pattern that is irregular, like a crazy-quilt, like the cracks in parched land. And the surface of the slab should undulate, so as to shed sand in patterns in the direction of the wind.”²³ While the black asphalt is at once a visual sign of danger, its sheer scale and radiant heat become a corporeal threat as well, as anyone attempting to cross it bakes on its hot surface.

The designs self-consciously avoid centering the monument or creating perfect forms employing Greek standards of proportion, not wanting to indicate that treasures can be found underneath. Instead, the panel plans to spread the entire contaminated plot with rubble (“Rubble Landscape”), blackened stones (“Forbidding Blocks”), or spikes poking through an uninhabitable grid (“Spikes in Grid”). A self-conscious primitivizing is effected, featuring irregular geometries, rough-hewn edges, an eschewing of craftsmanship, and a denial of technological sophistication. The panel attempts to create a primordial response, a powerful place charged with somatically felt, rather than understood, meaning—triggering notions of a void, abyss, or, as the openly Jung-influenced report puts it, “fear of the beast.”²⁴

However, the panel recognizes that while the marker should be visually compelling, it should avoid the fate of previous dramatic emblems of deterrence, which have been ignored or dismissed only to later become destination points for inquisitive tourists. The tombs of Egyptian rulers, while still visible today, were repeatedly raided despite sentinels and elaborate warnings. This is a paradoxical charge: the marker must be monumental but not too monumental, visible yet repulsive to sight, incredible and legible, but not so loaded with specialized information that it will be too complicated for an illiterate wanderer to understand. In the preferred designs, erosion over time will only enhance the marker’s aesthetic of desolation, reinforcing the message and heightening its capacity to warn. In “Spike Field” (fig. 8.3), shown here as a preliminary, not-to-scale, computer-generated plan, the concept of tilting thorns is pared down to simple, irregularly spaced obelisks interspersed with message kiosks and a dividing wall. “Spike Field” creates a landscape threatened by megaliths which bespeak intentional and labored effort. The jutting rocks, however, asymmetrically thrusting up through the man-made grid, resist any notion of ideal beauty and are meant to deny visual interest. Spikes are placed on a mesa of black concrete blocks which soak up the desert sun and concentrate it, making it impossible to plant on or drive machinery into the radioactive area. Ghostly visitors wander through the forest of granite into cozy

SPIKE FIELD

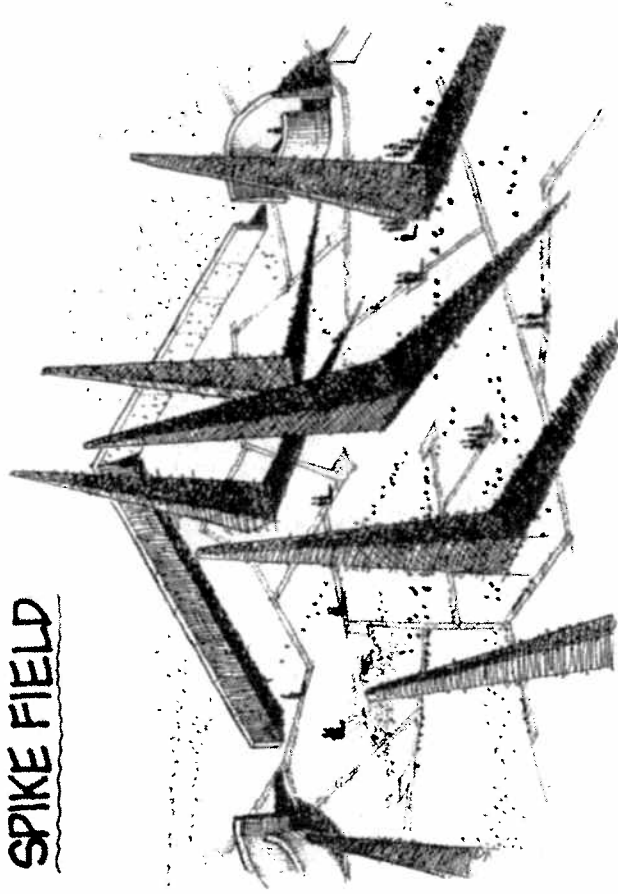


Fig. 8.3. “Spike Field, view 1.” Concept and art by Michael Brill. Courtesy Estate of Michael Brill.

concrete message kiosks, where Munch’s *The Scream*—once again recruited to register universal horror—is to be chiseled along with cautions in six different languages.

“Menacing Earthworks” (fig. 8.4) is the panel’s most favored design. It consists of lightning-shaped crooked stones, each fifty feet high, radiating from a flat center. In the middle is the remnant of a decayed concrete building—the current WIPP administration office, left to rot. The stones are meant to press in uncomfortably on the viewer, limiting her vantage points and leaving her disoriented: “Walking through it, the massive earthworks crowd in on you, dwarfing you, cutting off your sight to the horizon, a loss of connection to any sense of place.”²⁵ Rather than erecting a warning grid with clear sight lines and points of entry and exit, the designers prefer eliciting a haptic response from the viewer, who is integrated into, and viscerally repelled by, the structure. “Menacing Earthworks” has an overpowering presence which belittles and subsumes the viewer, who is meant to walk among the stones rather than survey them from above. There is a disconnect between the visual images shown here and the written description of the design, indicating two dis-

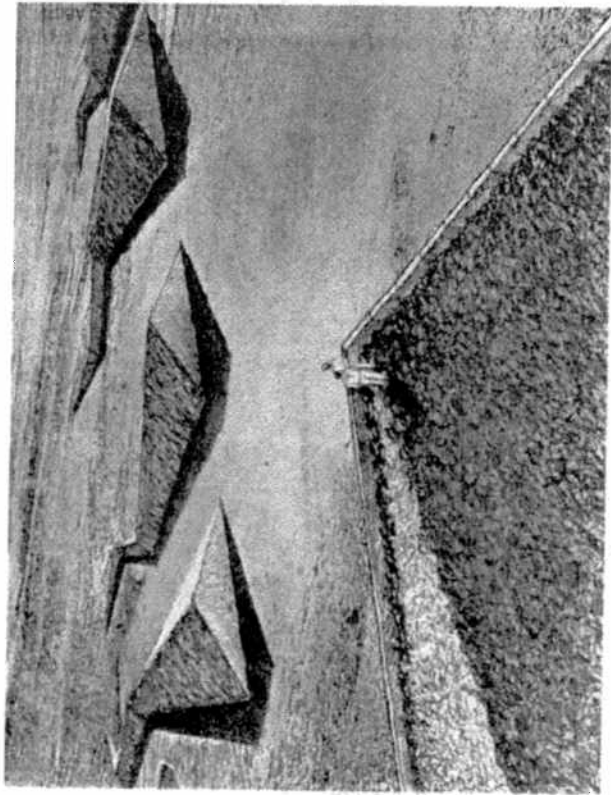


Fig. 8-4. "Menacing Earthworks." Concept by Michael Brill. Art by Safdar Abidi. Courtesy Estate of Michael Brill.

crept perspectives. These two figures standing on the earthwork, it seems, are not representations of the viewer who perambulates in confusion on the ground and ultimately flees, but rather indicate the position of the designers themselves. They stand on top of the tall rocks like tourists from the past surveying the future ruins. These diagrammatic means synthesize the received language of postcard vistas and scenic views, betraying their perceived confidence in their own inoculation against its hazards.

The use of the second person—"the massive earthworks crowd in on you"—transports the reader far into the future after the marker is built, while the grammar simultaneously insists on the present tense. The pressing of future and present together is one hallmark of the entire WIPP marker project, as the team is occasionally caught between tenses as it figures out whom (and when) it is addressing. Carl Sagan's idea, however ludicrous, in fact has a certain logic with regard to this time trouble; for the skull-and-crossbones is, to some extent, legible to us now, and hence might be decipherable in the future by archaeologists. Designs such as "Spike Field," however, have no contextual meaning in the present, rest upon no supporting interpretive framework, and hence are that much more blind to the future.

"Menacing Earthworks" shows a clear, if unintentional, affinity with the ruinous aesthetic found in much land art. It is clear that the tropes of monumental earthworks bear upon the WIPP team; indeed, James Turrell and others are mentioned in the Sandia report.²⁶ One compelling comparison might be Michael Heizer's desert *Double Negative* (1969–70), which displaced a quarter of a million tons of rock in Nevada in an oblique conversation with the nuclear bombs dropped nearby at the Nevada Test Site.²⁷ However, crucial to the tenets of earthworks is entropic pull, the drive toward obliteration with time, and WIPP mimes their designs for precisely the opposite purpose.²⁸ Whereas Robert Smithson's works crumble toward extinction in pursuit of his idea of entropy, the marker is motored by a quest for inherent, eternally stable form and meaning. It is this dream of positivism that leads the panel to a denial of art, which is repeatedly referred to within the report as "arbitrary" and "ambiguous." Despite this, the visual details of many earthworks and the proposed nuclear marker are surprisingly similar; in fact, a cautionary appendix in the report fears that the WIPP marker will be seen merely as the supreme example of this late-twentieth-century "school of outdoor sculpture."²⁹

While looking to art history and its range of interpretive tools would certainly be useful in the context of designing the marker, the report rejects the contributions made by art historians in understanding how visual imagery is read differently across time. Hence still-unresolved questions of intentionality surrounding the interpretation of the paintings at Lascaux,³⁰ for instance, are ignored in favor of a scientific argument that the WIPP marker can and will transmit its complex meaning through time: "[F]uture, more advanced scientists would have fewer problems interpreting pictographs, symbols and scripts purposely designed for transparency of interpretation."³¹ There was a suggestion of an open artist's competition, but panelist and scientific illustrator Jon Lomberg protested that "I'd die before I'd let the art world come anywhere near this." He further cautions:

The art world in places like New York is anti-scientific, anti-representational, and seems to favor more detached and (to me) nihilistic statements. . . . [T]hey are likely to end up picking a giant inflatable hamburger to mark the site.³²

This comment ignores the nihilism inherent in a field of spikes meant to keep bodies off a highly lethal nuclear waste dump. (And, unlike Mr. Lomberg, I would be very curious to see what Claes Oldenburg—someone who understands the absurd precepts of monumentality—might conjure for this project.)³³ Reminiscent of the opposition between Fredrick Hart's conservative Vietnam veterans' sculpture and Maya Lin's "antirepresentational" (and thus,

by Lomberg's account, "detached" and "nihilistic") memorial,³⁴ this gratuitous insult aimed at Oldenburg betrays WIPP's ultimate anti-art functionality and positions it ideologically against the earth art to which it bears a surface resemblance.

The planning of the WIPP marker follows on the heels of a tremendous period of monument design and construction. The past several decades have seen an explosion of documents, proposals, and groundbreaking, along with a blossoming of studies and critical assessments that challenge the conceptual bases of monumentality. A common critique of traditional monuments is that their allegorical forms bury memory and ossify the past, that they glorify destruction with elegant bronzes, consolidating the place of tragedy rather than activating a more diffuse and hence self-reflective decentering. Andreas Huyssen notes that "monumental" has become a negative word; monuments are seen as ethically and politically suspect, or more simply, just bad taste.³⁵ The WIPP marker has drawn one lesson from criticisms of conventional monuments: it should not be pretty. As the panel notes, even the durable pyramids were looted for their fine sheath of marble: better to steer clear of magnificence lest the marker inspire cultic worship or fascination.

Interestingly, these worries—that the marker might be inspiring or visually pleasurable, and hence entice rather than dissuade visitors—also came up in connection with the Holocaust countermonuments which have recently sprung up throughout Europe and the United States.³⁶ Countermonuments often de-emphasize loveliness, aiming instead for roughness, quietness, and introspection. And indeed, with the WIPP proposal's emphasis on uncertainty, dispersal, and denial of beauty, it would seem that the marker has certain affinities with Holocaust memorials. However, with its ambitions to show brute strength and inspire awe, the team seems to find fascistic aesthetics even more timeless than beauty. The organized, permanent environment of monoliths, messages, and sound (in some designs, wind wails through specially canistered stone chambers) creates a totalitarian *Gesamtkunstwerk* that has more in common with Albert Speer's visions of building Nazi Germany so that its ruins would remain glorious for posterity than with eloquent works such as Esther and Jochem Gerz's *Monument against Fascism* (1986–93). The Gerzes' memorial consists of a column that gradually sinks into the ground as its soft surface is scribbled upon by passersby, its literal disappearance allegorically presaging the slow decline of collective memory itself. This is a far cry from the heavy, overwhelming megaliths of the WIPP marker, which will bear down upon future viewers in the New Mexico desert for ten thousand years with a wish to transcend language in order to convey a horror that will be "more felt than understood."³⁷

The WIPP team, with its drive toward monumentality, dismisses the possibility that the marker might simply be ignored or erased and emphatically overloads the designs with hugeness in order to maintain the high pitch of its rhetorical address. As Robert Musil has noted, monuments fall easily toward the invisible.³⁸ How naturalized into the landscape might these stone spikes become in one hundred years, much less ten thousand? The marker's deliberate archaism could merely confuse future audiences as to its moment of production. Rather than speaking to its precise era of conception, the marker muddles its own temporal context: for the benefit of the future, it is made to look as if it is from the past.

One distinctive aspect of the WIPP marker is its true inseparability from its site—its hyperbolically indexical relation to the landscape. It must be located directly on top of the buried waste, declaring that *here* is the locus of danger. (Interestingly, the French National Agency for Radioactive Waste Management contradicts the U.S. findings, recommending that radioactive waste markers should be 10–20 kilometers away from the actual site as a distracting measure.) Thus fixed in space, it conforms to Rosalind Krauss's logic of the monument as that which is site-specific, declaratively placed.³⁹ At least two fundamental units of meaning need to be communicated by the marker: first, the location of the site, and second, its danger. The panel's working assumption, following the EPA's charge, is that *knowledge alone* of the radioactive toxicity will be sufficient deterrence. The Department of Energy, in insisting on building an expensive marker for WIPP, aims to consolidate all nuclear fears onto this one spot, creating for the future a definitive map of where danger lies. The emphasis on a singular site disregards the many other radioactive landscapes that still bear the traces of nuclear activity. Why lavish attention on *this* site when others have been wasted by radioactivity? For instance, at the Savannah River site in South Carolina, 135 gallons of spent nuclear fuel were poured into shallow holes drilled into the earth. At this deadly place, the holes were simply filled with dirt, plugged with concrete, and marked by a small plaque. And just a few miles from New Mexico's WIPP, a nuclear test blast entitled Project Gnome went awry in 1961, spewing radionuclides over the exploded landscape. There a granite slab marker was erected to ward off trespassers. Written on a copper plaque, green from oxidation, is the warning **TIBUS SITE WILL REMAIN DANGEROUS FOR 24,000 YEARS**.⁴⁰ The raised lettering is corroded almost to the point of illegibility, and cattle have rubbed against it for the past thirty years, nudging it several meters from its original site. I point to these sites, two of many examples in the long history of nuclear disaster, to demonstrate the U.S. government's Janus-faced attitude toward radioactivity: the present dangers of nuclear waste, which continues to be manufactured, are

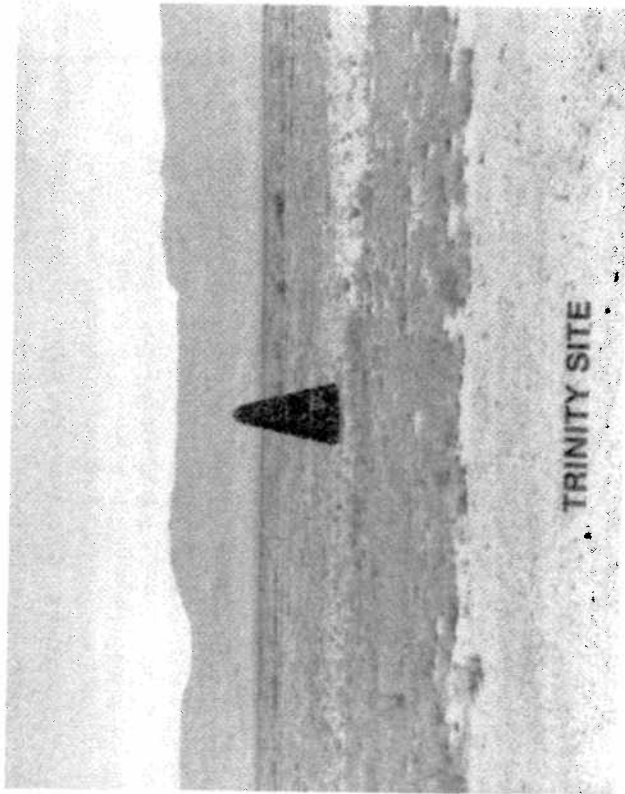


Fig. 8.5. Peter Goin, "Trinity Site," 1991. From Peter Goin, *Nuclear Landscapes* (Baltimore: Johns Hopkins University Press, 1991), 29. Photograph courtesy of Peter Goin. Reprinted by permission of The Johns Hopkins University Press.

downplayed white billions are spent to warn the future about one small portion of the U.S. radioactive remains.

These markers are not the only concrete reminders of the imprint left by decades of nuclear activity in the American West. "Trinity Site, 1991" by photographer Peter Goin (fig. 8.5) documents a stone stele that commemorates the first atomic blast, detonated in 1945. This, too, is New Mexico, and Goin's photograph, with its straightforward documentary style, seeks by force of sheer banality to make this monument strange. Goin wants to render the damage done to the southwestern land, yet the desert's eerie palette of colors and dusty surfaces already look devastated.⁴¹ The marker, centered in the image and at some distance from the camera's lens, is presented to us matter-of-factly, and its radioactive energy is made known only by the caption. So unassuming that it risks being entirely overlooked, this is a monument made ironic. One of a series of Goin's "nuclear landscapes," "Trinity Site" utilizes the conventions of bald photojournalistic "objectivity" as a part of its strategic political point. In the face of governmental secrecy, these works act as alternative archives, keeping precise records of who and what has been damaged.

Patrick Nagatani's 1989 "Trinitite, Ground Zero" (fig. 8.6), made in collaboration with Andrée Tracey, is a photo of the same stone marker, but it is made stagily and explicitly toxic. Chunks of dayglow green rock rain from a threatening sky as an atomic worker absurdly shields himself with an umbrella. Nagatani denaturalizes the landscape by using photomontage to try to make perceptible the lingering radioactivity. In sharp contrast to Goin's almost military precision, Nagatani's collaged works are fantasies where hidden truths can be visualized. Both Nagatani and Goin are part of a loose confederation of artists who are committed to documenting the nuclear age—others include Carole Gallagher, Paul Shambroom, Richard Misrach, and Robert del Tredici. Working since the early 1980s, artists and activists such as these photographers have set out to record the human and environmental costs of the nuclear age, fighting to document what is in fact highly resistant to imaging. Because radioactivity's damage is wreaked over decades, and even passed on to future generations, it is very difficult to capture it in the brief, instantaneous flash of the camera. It is high irony that with the WIPP marker, the state has



Fig. 8.6. Patrick Nagatani in collaboration with Andrée Tracey, "Trinitite, Ground Zero," 1988–89. From Patrick Nagatani, *Nuclear Enchantment* (Albuquerque: University of New Mexico Press, 1991), plate 1. Courtesy Patrick Nagatani.

set out to do what many could not, which is to make visible, confirm, and authenticate the threat of radiation.⁴²

The Waste Isolation Pilot Plant marker is a remarkable instance of a state-ordained attempt to control the future of information, an expensive effort to manipulate, even custom-design tomorrow. While origins or beginnings are critical for myths of the nation, it seems just as critical to understand how the nation ideologically plots for the far, far future. What kinds of institutions are being set into place by the United States with this project? A different WIPP panel has suggested the creation of a nuclear priesthood whose purpose would be to maintain and safeguard information about the site, or the invention of an epic oral poem that might ignite the imagination of the public and be passed down through the generations. Or the construction of a parliamentary body called the House of Future Affairs whose duty would be to reproduce and manage the warning system. Or the enlistment of a corporation to create a lovable cartoon character—their suggestion was “Mickey Nuke”—who would perpetually enchant and forever caution children about the dangers of WIPP.⁴³ Turning the most deadly site in the United States into an absurdly banal image of commercial cheer fits in well with the studied nonchalance so characteristic of official attitudes toward nuclear harm—from the early “Atoms for Peace” campaign in the 1950s to today’s indifference toward the devastation caused by nuclear power. The ostensible end of the cold war and our increasing distance from the catastrophes of the nuclear age such as Chernobyl have led to a general relaxation about this particular threat.⁴⁴ In Missouri, a former nuclear production site—still laced with radioactivity—has been revamped as a family-oriented museum.⁴⁵ The fundamental premise of WIPP is consonant with this new comfort level with nuclear power: the harm has not yet happened, is very remote, and is completely avoidable.

Monuments usually have specific functions: to uphold a current regime, explain or educate, pay homage. In all of these roles, they actively create memory. The WIPP marker, to be sure, is not precisely a monument, but it does strategically wield the tropes of monumentality. The design of the WIPP marker thus tells us much about the status of monument making in the late twentieth century. Monuments can be erected to act as testaments, to offer proof in the form of relics of destruction. The WIPP marker, perversely, is a relic not of destruction but of its very potentiality, as misunderstanding or disobeying its warning might be fatal. If its mission to deter fails, it will be nothing more than a crypt for the deaths that will occur after the waste site is breached. The monumental marker will become instead a memorial, a future cemetery.

Often, monumental architecture buttresses national origins; the WIPP marker acts as a limit case that searches for an endpoint or terminus. This is

how the government imagines itself on fast-forward and addresses itself to the future—a future of subjects psychologically cowed by sheer masses of heavy stone. It is a type of deferred imminence that we are unaccustomed to examining: not the sudden blast of nuclear apocalypse but a protracted, steady, inevitable poisoning. What are our paradigms for futurity? We have words for the structures of our relationship to the past: nostalgia, amnesia, sentimentality, history. But what words do we have for the future besides anticipation or dread—prophecy?

Time itself is a decaying force; it erodes meanings and messages in the same way that radioactive particles break down. In order to stick in the annals of collective history despite this incessant erosion, memory needs to have a specific address; Pierre Nora calls it the “will to remember.”⁴⁶ Here is that address pulled to its breaking point: the audience is everyone—everyone today, everyone tomorrow, everyone forever. The marker’s very universality renders it vulnerable to inconsequence and semiotic impenetrability. This is something the panelists have ignored: the felicity of the speech act, the context of its reception, and the way its meaning is shaped and conditioned by narrative circumstances.⁴⁷ Sandia Laboratories and the Department of Energy agree that questions of cosmological legitimacy and extreme duration are best put to scientists—those who trade in probabilities, statistics, and distant time spans that to most humanities scholars seem unimaginable, verging on science fiction. Yet the longevity of the marker, and its semiotic coherence long into the future, are complexly implicated within the realm of the visual. To untangle the proposals for the WIPP marker is also to ask questions about how monuments regard the future: Do they view the future as continuous with the present? How will their contextual address shift, destabilize, or collapse?

In the WIPP marker, seemingly disconnected terrains come to occupy the same map: waste management, governmental land use, nuclear politics, and the visual specifics of monumental architecture. Investigating the centuries-long legacy of nuclear waste is of special urgency in the aftermath of September 11, 2001, given George W. Bush’s plans to increase the use of nuclear power for the nation’s energy problems, his enthusiasm for missile buildup, and his deployment of nuclear fears to galvanize support for a war against Iraq.⁴⁸ The plans for this eternal marker tell us much about our construction of the future and how we read it. They contest profound beliefs about the stability of visual imagery, delving into prophetic realms usually associated with religion, magic, or science. Indeed, the very provisional nature of this marker is what makes it so interesting, for these plans necessarily beg several salutary questions. How can the future itself be a site of study, and what will trying to divine it tell us about history? How sufficient are our means for making and preserving memory?

WIPP produces a speculative viewership within both rhetorical and real spaces. One could say that the marker commemorates something that has not yet happened in order to erase that which has, building a huge marker to rivet our gaze away from the Savannah River Site in South Carolina or the Nevada Test Site. The plans for inscribing cultural memory at WIPP demonstrate the state's refusal to admit a contaminated present. It is for precisely all the reasons that critics of monuments decry them—they solidify history and locate it too precisely—that WIPP, under the guise of a "marker," so desperately wants a monument.

The questions that WIPP raises about the persistence of information and memory loss are strikingly relevant for art history: all images regard the future, it just depends on how far out we draw the timeline. All monuments must account for the fraught dream of embedding a deep history within them. "This place is a message and part of a system of messages. Pay attention to it! . . . We considered ourselves a powerful culture. This place is not a place of honor. No highly esteemed deed is commemorated here. Nothing is valued here. . . . What is here was dangerous and repulsive to us."⁴⁹ So reads the inscription on a towering monument planned by the U.S. government to mark the site of the country's only deep geological radioactive waste dump. The instabilities of visual signs over time, inherent to the challenge of art history, are here discarded, as the engineers who build the marker are sure of progress and a clean concrete signifier. For them, the future is not uncertain but unfolds according to laws, equations, and calculations. Theirs is a future of ever-improving technology, one without apocalypse, deterioration, or regression: this is what Walter Benjamin calls "homogeneous, empty time."⁵⁰ The WIPP marker aspires to be a solid center point of time, an obdurate witness that casts an impassive eye on the centuries as they unfold. In his "Theses on the Philosophy of History," Benjamin writes a chilling vision of the angel of history, with the storm of progress caught in its wings. It flies with its face turned away from the future, with catastrophic wreckage piling at its feet. In the WIPP marker is built a new, stone angel of nuclear history, and it too is propelled into the future while it is determined only to look back. And the horrible waste keeps heaping underneath it.

NOTES

1. There are other radioactive waste storage facilities located in Oak Ridge, Tennessee; Rocky Flats, Colorado; and Savannah River, South Carolina, but WIPP is the only storage site meant to hold radioactive wastes forever. Sites such as Rocky Flats were built as temporary solutions to the country's nuclear waste problems, and it is still unknown if the materials there will be reused or will need to be removed and buried elsewhere. For a trenchant look at the

waste disposal crisis in the United States, see Valerie L. Kuitez, *The Tamed Desert: Environmental and Social Risk in the American West* (New York: Routledge, 1998).

2. These nonhuman disruptions were studied in great detail before the opening of the site. See, for example, Peter Davies, *Variable Density Groundwater Flow and Paleohydrology in the WIPP Region, Southeastern New Mexico* (Denver: U.S. Department of Energy, 1989); Stephen Richey, *Geologic and Hydrologic Data for the Rustler Formation Near the WIPP* (Denver: U.S. Department of Energy, 1989); and Allan Sanford, *Seismicity in the Area of the Waste Isolation Pilot Plant*, Sandia National Laboratories SAND80-7096, 1980. These and other DOE reports are in the public domain.

3. WIPP was built and is overseen by Sandia National Laboratories under contract from the Department of Energy. Environmental activists contend that WIPP's design creates a significant potential for contaminating the area's groundwater, and these debates delayed the opening of WIPP for almost twenty years. The first legislative mandate for a defense transuranic waste storage site was passed in 1979; the facility itself was begun then, but it then languished owing to court battles until 1999, when it began receiving waste. The most comprehensive account of the history of WIPP is Chuck McCutcheon's *Nuclear Reactions: The Politics of Opening a Radioactive Waste Disposal Site* (Albuquerque: University of New Mexico Press, 2002).

4. The site will remain radioactive past 12,030, but feasibility studies led the EPA to opt for this date as one in which the most significant risks will be sufficiently reduced.

5. Assurance Requirements, EPA, 40 CFR 191.14c, 1985, quoted in Kathleen M. Trauth, Stephen C. Hora, and Robert V. Guzowski, *Expert Judgment on Markers to Deter Inadvertent Human Intrusion into the Waste Isolation Pilot Plant* (Albuquerque: Sandia National Laboratories, 1993, contract DE-AC04-94AL85000), F. 19. This document includes all the drawing and plans referred to here.

6. The panel consisted of thirteen members, representatives of the following disciplines: materials science, architecture, environmental design, anthropology, linguistics, archaeology, astronomy, communications, geomorphology, scientific illustration, and semantics. The panel was broken into two teams, who developed their proposals independently of each other. Their final recommendations had remarkable overlap, and thus I refer to the panel as a whole rather than distinguishing between the two component teams, although I quote team members by name when I refer to their personal statements. There was, however, one significant difference in the two approaches which deserves mentioning. Team A was far more sympathetic toward artistic modes of communication than was Team B, which perhaps accounts for the wonderfully rendered drawings conceived by Team A member Michael Brill and drawn by Saldar Abidi. Before his death in 2002, Brill was very generous with sharing his designs with me, and I thank Sue Weidemann Brill for granting permission to reprint them. The personal statements printed in *Expert Judgment* are often thoughtful musings on memory, nuclear hazards, and strategies of markings, particularly Frederick Newmeyer's—moments of wisdom that, I hasten to add, were minimized in the bulk of the final governmental report.

7. *Expert Judgment*, F. 39.

8. Michael Baxandall's widely influential notion of the "period eye" was elaborated in his *Painting and Experience in Fifteenth Century Italy* (Oxford: Oxford University Press, 1972). Indeed, most current art historical methodologies, including social art history and semiotic theories of visual culture, take as foundational the disputation of stable, transhistorical interpretations of objects and images.

9. The Marker Panel recommendations have been passed along to the Westinghouse Corporation, which will be responsible for the final marker design and construction when the vaults are sealed in 2030.

10. *Expert Judgment*, F. 24-25.

11. *Ibid.*, F-142.
12. *Ibid.*, F-95.
13. These drawings illustrate only a small corner of the total area to be covered.
14. A sketch is reproduced in *Expert Judgment*, G-13; owing to space considerations, I was unable to reproduce it here.
15. "After installation, passive markers should remain operational without further human attention." *Ibid.*, A-3.
16. Sagan declined to join the Marker Panel owing to scheduling conflicts, but sent in a letter urging the use of the skull and crossbones. Letter printed in *ibid.*, G-88.
17. "We decided against simple 'Keep Out' messages with scary faces. Muskums and private collections abound with such guardian figures removed from burial sites." *Ibid.*, F-34.
18. Laurie Anderson has commented on the ambiguity of this drawing in her 1979 performance *Americans on the Move*: "Do you think they will think his hand is permanently attached that way? Or do you think they will read our signs?" Reprinted in *October* 8 (spring 1979): 45-57. Craig Owens sees the man's raised hand as an image of sexual difference. To the aliens who might read these signs, it could appear that on our planet only men speak, while women are still and silent. "The Discourse of Others: Feminists and Postmodernism," in *Beyond Recognition: Representation, Power, and Culture* (Berkeley: University of California Press, 1992), 166-90.
19. This capsule was designed to give a rudimentary knowledge of human languages and included images, texts, and sound recordings.
20. *Expert Judgment*, F-43.
21. *Ibid.*, F-115.
22. *Ibid.*, F-152.
23. *Ibid.*, F-58.
24. *Ibid.*, F-42.
25. *Ibid.*, F-58.
26. *Ibid.*, F-135.
27. For work on the use of the West as a nuclear ground zero, see Bruce Hevly and John M. Findlay, eds., *The Atomic West* (Seattle: University of Washington Press, 1998).
28. See Smithson's "Entropy and the New Monuments," *Artforum* (June 1966), reprinted in *Robert Smithson: The Collected Writings*, ed. Jack Flam (Berkeley: University of California Press, 1996), 10-23.
29. Jon Lomberg's statement, *Expert Judgment*, G-85.
30. The cave paintings from Lascaux, dating to around 15,000 B.C., are late in the Paleolithic era; some date back to 23,000 B.C. The issue of archaeological "intentionality" is taken up by Whitney Davis in *Replications: Archaeology, Art History, Psychoanalysis* (University Park: Pennsylvania State University Press, 1996).
31. *Expert Judgment*, G-65.
32. *Ibid.*, G-85-86.
33. In 2001, the Marjorie Barrick Museum at the University of Nevada-Las Vegas, held an open competition inviting artists to design universal warning signs for the nuclear waste dump scheduled to open at Yucca Mountain, Nevada. The winning entry proposed planting the entire mountain with genetically modified, self-replicating, cobalt blue cactuses.
34. For an extensive discussion of these contrasting visions of public memorials, see Marita Sturken's *Tangled Memories: The Vietnam War, the AIDS Epidemic, and the Politics of Remembering* (Berkeley: University of California Press, 1997).
35. Andreas Huyssen, "Monumental Seduction," in *Acts of Memory: Cultural Recall in the Present*, ed. Mieke Bal, Jonathan Crewe, and Leo Spitzer (Hanover: University Press of New England, 1999), 191-207.
36. See James Young, *The Art of Memory: Holocaust Memorials in History* (Minuch: Prestel-Verlag, 1994), and *The Texture of Memory* (New Haven: Yale University Press, 1993).
37. *Expert Judgment*, F-41.
38. Robert Musil, "Nachlass an Lebzaiten," in *Gesammelte Werke*, ed. Adolf Frise (Reimbek: Rowohlt, 1978), 2:506-9.
39. Rosalind Krauss, "Sculpture in the Expanded Field" (1978), in *The Originality of the Avant-Garde and Other Modernist Myths* (Cambridge: MIT Press, 1988), 276-90.
40. This site was explored and documented by Gregory Benford in his *Deep Time: How Humanity Communicates across Millennia* (New York: Perennial, 1999).
41. I have argued elsewhere that the Department of Energy chooses sites such as Nevada and New Mexico because they already look postnuclear; "Zero Visibility: Picturing Nuclear Test Sites and the Landscape of Disaster," presented at "The Coercive Image," graduate art history conference, University of Southern California, 1999.
42. After tens of millions of dollars spent on legal fees defending the government from lawsuits that insisted that bomb making caused genetic damage, leukemia, immune suppression, cancer, and early death, in August 2001 payment finally began for the families of these radiation workers, many of whom died decades ago from cancer. See Michael Janofsky, "Nuclear Cleanup Workers Exposed to Radiation," *New York Times*, December 8, 2000, A4; Matthew Wald, "U.S. Acknowledges Radiation Killed Weapons Workers," *New York Times*, January 29, 2000, A1; Michael Flynn, "A Debt Long Overdue," *Bulletin of the Atomic Scientists* (July/August 2001): 39-49; "Payments to Begin for Arms Workers Ill from Radiation," *New York Times*, July 30, 2001, A12.
43. These possibilities were considered by four expert commissions that were convened simply to spin out scenarios for the future; they met separately from the Marker Panel. See *Expert Judgment on Inadvertent Human Intrusion into the Waste Isolation Pilot Plant*, Sandia Report, SAND90-3062, 1993, and the follow-up *Effectiveness of Passive Institutional Controls in Reducing Inadvertent Human Intrusion into the Waste Isolation Pilot Plant for Use in Performance Assessments*, WIPP/CAO-96-3168, 1996. The panel built models of probability which account for changes in population, environment, war, and disease. Some scenarios point to religious cults digging up the site in search of higher meaning, or a society of prisoners where prisoners mine the site since they are incapable of understanding the dangers. The only scenario in which the warning is effectively communicated is one in which the distant future, a "Disney-sponsored WIPP World" has become a major tourist attraction. Mickey Nuke is a fictional character that survives many generations. As long as he survives, the warnings about WIPP survive. The utterly grim sense that capitalism, spectacle, and cartoon knowledge are our best possible hope is perhaps indicative of a general failure of imagination, as Fredric Jameson puts it, with regard to alternate political systems. One scenario sees a "feminist world" as soon as 2191 (if only) where "women dominate society partially through the selection of girl babies. Twentieth century science is discredited as male arrogance. Warnings about repository are dismissed as another example of muddled masculine thinking." This misguided scenario sees patriarchy as somehow less durable than capitalism, and curiously understands antirationalism as the basis for feminism.
44. Despite the current (2003) U.S. administration's hypocritical hand-wringing about weapons of mass destruction, the frenzy of concern about nuclear arms has waned since the Reagan era. The mid-eighties in particular saw activists and scholars alike fixated with special intensity on the apocalyptic threats of nuclear energy and weapons. In 1984, a special issue of the journal *Diacritics* entitled "Nuclear Criticism" suggested that "the nuclear" was so

basic to collective understandings of contemporary culture that it would be the next great academic interdisciplinary field. *Diacritics* 14, no. 2 (summer 1984). For a brilliant take on why this did not happen, see Peter Cowello's "Apocalypse from Now On," in *Queer Frontiers: Millennial Geographies, Gender, and Generations*, ed. Joseph Boone et al. (Madison: University of Wisconsin Press, 2000), 39-63.

45. See Stephanie Simon, "From Atomic Dump to Tourist Draw," *Los Angeles Times*, August 13, 2002, A1, 8.

46. Pierre Nora, "Between Memory and History: *Les Lieux de Mémoire*," *Representations* 26 (spring 1989): 7-25. The marker might seem to be the ideal example of Nora's delimitation between artificial histories and the "true" memories they supplant, but his binary is troubled when it comes to such an organized, yet utterly untested, effort to tailor future responses. Those steeped in recent debates about distinctions between collective versus public memory might quibble with my loose application of these terms, but the extreme temporal dislocations caused by discussing an unbuilt marker that will function as a visible generator of memory well into the future has led me, by necessity, to a certain simplification of terminology.

47. In different contexts, both J. I. Austin and Mikhail Bakhtin have argued for the social embeddedness of signification. See Austin's *How to Do Things with Words* (Cambridge: Harvard University Press, 1962), and Bakhtin's *The Dialogic Imagination: Four Essays*, ed. Valim Lappunov, trans. Michael Holquist and Caryl Emerson (Austin: University of Texas Press, 1981).

48. With this renewed interest in nuclear power comes new questions about how and where to store nuclear waste: battles rage in Congress over which states will house these materials, with some desperate to keep dumps out, and some, usually in very impoverished areas, eager for the jobs they might create. Meanwhile, waste languishes in inadequate storage facilities. See Matthew Wald, "A Shift in Strategy for Radioactive Waste in Nevada," *New York Times*, July 31, 2001, D1, 2.

49. *Expert Judgment*, F-49.

50. Walter Benjamin, "Theses on the Philosophy of History," in *Illuminations: Essays and Reflections*, ed. Hannah Arendt, trans. Harry Zohn (New York: Schocken Books, 1968), 253-64.