



# DEEP TIME, SHORT SIGHT

BRACING FOR YUCCA MOUNTAIN'S NUCLEAR FOREVER

BY R.C. BAKER

IT'S 12,000 A.D.  
DO YOU KNOW  
WHERE YOUR  
NUCLEAR WASTE  
IS? A PROPOSED  
EARTHWORK  
TO WARN FUTURE  
GENERATIONS.

IN 1945, AS THE FIRST ATOMIC BOMB WAS DETONATED IN THE NEW MEXICO DESERT, ONE OF ITS CREATORS, PHYSICIST J. ROBERT OPPENHEIMER, RECALLED A LINE FROM HINDU SCRIPTURE: "NOW I AM BECOME DEATH, THE DESTROYER OF WORLDS." THIS BEING AMERICA, THOUGH, SOMEONE SMELLED A PROFIT BEHIND THIS ALMOST BIBLICAL SOURCE OF POWER—NINE YEARS LATER, THE ATOMIC ENERGY ACT ALLOWED PRIVATE COMPANIES TO BUILD COMMERCIAL NUCLEAR REACTORS, WITH THE PROMISE OF "ENERGY TOO CHEAP TO METER." BUT THE BILL FOR THREE GENERATIONS' WORTH OF NUCLEAR POWER IS NOW COMING DUE. THE DEPARTMENT OF ENERGY IS PROPOSING TO TRANSPORT HIGHLY RADIOACTIVE MATERIAL FROM ALL OVER AMERICA TO A NUCLEAR WASTE DUMP INSIDE YUCCA MOUNTAIN, NEVADA. GOVERNOR KENNY GUINN ESTIMATES CONSTRUCTION (SEE PAGE 24)



of the facility will eventually cost more than \$60 billion.

He and most other Nevadans (with the exception of some local brothel owners, who predict a free-spending clientele among the army of workers expected at the site) are not happy that their state, already host to the radioactive leavings of decades of nuclear weapons tests, would receive 7 billion curies more. (By comparison, the accident at Three Mile Island released 15 curies.)

In an interview, Steven Frishman, a geologist with Nevada's Nuclear Waste Task Force, talks about "downwinders," people who suffered deadly, long-term effects from the weapons testing, and how the federal government "knew it was dangerous and they weren't telling people." Now, he says, that same government, along with the nuclear industry, is "spinning the site," using "extraordinary levels of optimism and trying to convince people that it's safe because they have a political need to do it, not because it's actually a safe thing to be doing."

The problem? The waste is so lethal that by law it must be completely isolated for a minimum of 10,000 years. But many scientists (including a panel from the National Academy) dismiss that time span as a bureaucratic convenience. Others point out that much of the waste (mostly spent fuel rods from commercial and military reactors) will contain uranium, plutonium, and myriad other "iums" that will be dangerous for upward of a million years. Nevada's concern is that the site is not sound enough geologically to keep the waste from eventually getting into the groundwater, food chain, and air. DOE's own best case shows no violation of current radiation dose standards for roughly 100,000 years, but, as Governor Guinn's recent letter to Congress points out, DOE's computer models "have an uncertainty factor of 10,000."

Still, the Yucca Mountain site is heading for a final, too-close-to-call vote in the Senate, and if it is approved, the maw of bureaucracy must be served. The Environmental Protection Agency has decreed that some kind of marker be erected to deter human beings from entering, drilling, digging, mining, or doing anything that would disturb the site or release its contents into the environment for the 10-millennium regulatory period.

So artists, architects, and engineers must grapple with a time span at the outer limits of cultural imagination, a period that must take into account climatic change (will the brutal desert currently surrounding Yucca become wetter in a few thousand years?) and geology (there have been 600 earthquakes of 2.5 or greater magnitude in the area since 1982). And then there is humanity: As Frederick Newmeyer, president of the Linguistic Society of America, points out, any language becomes "unintelligible to the descendants of the speakers after the passage of between 500 and 1000 years." (Read any Chaucer lately?) So how do we warn away people whose language, society, and beliefs we'll never know, who may have undergone revolutions, disasters, wars, or epidemics right out of *The Stand*?

The challenge of communicating danger over vast reaches of time was taken up by an exhibition earlier this year at the University of Nevada, Las Vegas, entitled "Universal Warning Sign: Yucca Mountain." The organizer of the show, Joshua Abbey, wanted to use art to educate the public about the long-term hazards of the proposed dump. He received entries from around the world, many of which used the trefoil symbol for radiation, designed in 1946. But the meanings of symbols change drastically over time and from culture to culture. The swastika, long revered in many parts of the world as a symbol of good fortune, is metaphorically radioactive in others—it will

get you jail time in Germany.

The winning entry illuminates the problem of communicating tens, hundreds, and thousands of generations into the future. Ashok Sukumaran proposes to seed all of Yucca Mountain with self-replicating, genetically engineered, cobalt-blue cactuses, using this unnatural contrast against the ochre of the desert as a living warning. Clearly, though, this painted desert would be hauntingly beautiful and alluring, and might draw people rather than repel them. And there's the rub: Art and architecture act as our highest expressions of humanity, not as shouts of danger. Libby Lumpkin, the founding curator of the art collection in Steve Wynn's Bellagio Hotel, said one of the reasons she was interested in being a juror was "it was a show that no one could succeed at."

Not that the government hasn't been on the case. The template for the eventual marker at Yucca Mountain was conceived in the early '90s for the Waste Isolation Pilot Plant near Carlsbad, New Mexico, the eternal (or so the DOE hopes) subterranean home of the detritus of the nuclear arms race. Among other things interred there are "contaminated laboratory piping, and booties and masks," says Michael Brill, an architectural theorist and professor at SUNY Buffalo. He led one of two teams of linguists, artists, engineers, archaeologists, and other experts, who were charged by Sandia National Laboratories to design a method of keeping future Indiana Joneses out of this real temple of doom. "Passive Institutional Controls," meaning monuments impervious to harsh climate and sand-blasting winds, are mandated, because even the federal government has to acknowledge it might not be around in a few hundred years, never mind millennia hence.

Right off, Brill's panel discussed leaving "great piles of this deadly shit above grade" so that anyone wandering near the site would be-

come ill and die. The panel roundly rejected using corpses as "BEWARE" signs, however, due to inter-generational responsibilities: Our electric lights today shouldn't cause death or mutants tomorrow. So Brill's team concentrated on archetypal images of danger, things that are hardwired in all of us regardless of culture, and came up with massive, square-mile complexes such as Landscape of Thorns (50-foot-high concrete spires with sharp points jutting out at all angles), Forbidding Blocks (black, gargantuan, irregular cubes of stone, too narrowly spaced and hot to provide shelter), and other "menacing earthworks," all designed to convey "poisoned and parched and dead land, a place that's really no place." Anti-art, in other words. Buried granite chambers with warnings in the official languages of the UN were also planned, along with space to re-carve them in whatever languages evolve over deep time.

DOE has opted for a cheaper design: a 33-foot-high earthen berm, half a mile square, studded by granite monoliths inscribed with warnings and pictograms of radiation danger. It has incorporated the experts' ideas for an information kiosk; high vantage points from which to survey the entire danger area; radar-reflective trihedrals; and small buried markers to warn against excavation or digging. Still, nothing will be built at the New Mexico waste plant until 2083, nor at Yucca Mountain until sometime in the 24th century. Transporting, storing, and finally sealing off such lethal material is a thorny, fraught process that we will not live to see completed.

"Art is long; life is short," goes the old saying, but neither can cope with the insidious longevity of radiation. We can only hope our distant, unknowable descendants will understand that their ancestors crossed a line in this century—that our mummy's curse is not metaphorical or metaphysical, but very much the real thing. ▀