

University of Nevada, Reno

Silence and Fallout: The Nuclear Legacy of a Father and Son

A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in English

by

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May, 2014



THE GRADUATE SCHOOL

We recommend that the dissertation
prepared under our supervision by

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Entitled

Silence and Fallout: The Nuclear Legacy of a Father and Son

be accepted in partial fulfillment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY

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Abstract

This dissertation explores nuclear testing in Idaho's Lost River Desert, including the first deadly nuclear explosion on United States soil. Through personal experience, research, and interviews, the author traces nuclear experimentation as it weaves through the history of the Lost River Desert and the cultural, economic, and religious history of the atomic cities nearby.

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Silence and Fallout: The Nuclear Legacy of a Father and Son

Most of my memories, either consciously or subconsciously, looking back, begin with silence—the silence of a room once vibrating with the rattle of my father’s labored breathing, in relentless, sporadic rhythms. When the breathing stopped, silence became my oldest memory.

The Lost River originates as meltwater atop Idaho’s Lost River Range, a spine of craggy peaks extending from the wilderness of central Idaho to the basalt beds of the Lost River Desert. The meltwater tumbles 12,000 feet before joining several creeks and groundwater springs in the valley below. The Little Lost threads a path through alfalfa and potato fields; it meanders behind a church, where it reflects the steeple and the cross on its glassy surface; it pushes by the rusted bones of old Detroit, cars sunk into its bank to prevent erosion; it gathers, as it passes, what it touches and carries what it gathers to the Lost River Desert, where it winds a broken path through the basalt beds and sage until it crosses the western border of the Department of Energy’s Nuclear Reactor Testing grounds. The river then disappears, as if it were swallowed by the desert, lost.

Our father taught my brother and me how to catch wild trout on the Little Lost. Those summer days we would head out from our little place on the edge of the Snake River Plain, making our way across the Lost River Desert and past the Nuclear Testing grounds to the willowy banks of the Little Lost. We would spend the day catching small trout and later organize our catch according to size and quantity. My father would often

break into story about fishing the Little Lost with his father when it became clear that he had both caught more and bigger trout.

My father knew no other life than the one lived in this tiny world, a forgotten landscape in the Idaho high desert, a world so entirely cut off from the rest of the country that he barely had reason to believe in anything that happened outside of this nuclear microcosm. This microcosm included the land amassed on the Lost River Desert by the Atomic Energy Commission, roughly the size of Rhode Island. Whatever else he knew about the testing site—his perhaps vague understandings of nuclear research reported in the local papers—was less important than the prosperity the site brought to this impoverished little world. What was visible to him, what he could see and touch, surpassed any other logic, and what he could see and touch reassured his safe place in this world, his ability to feed his growing family, his faith in hard work.

Back then, as we would wind our way back home through the Lost River Valley, eating M&M's and drinking pop, I remember always searching for the Nuclear Testing Station's iridescent hue in the night sky. When it appeared suddenly when the highway turned south suddenly, I could see the soft glow reflecting off the Little Lost River, and I would trace its snaking pattern on the windshield. On one of these nights, I remember asking my father why the river was named the Little Lost. He looked at me for a moment, pinched his eyebrows together, then turned his gaze to the fading image of the glowing river. "It gets lost out there on the desert somewhere," he said, looking back down to see the scowl on my face. At the sight of this disappointment, he winked and said, "Eat your candy." And so I did. But I imagined that the river was not lost. I

imagined that it wound its way through the sagebrush, toward the rows and rows of white glowing buildings, out where my imagination stopped.

My father had never known a life without the presence of nuclear testing in one form or another. He viewed nuclear reactors and the attendant infrastructure as fully integrated into the landscape, simply part of the natural setting, rendered as commonplace as churches. The edge of this nuclear world, for my father, was the family forty acres, hunkering beneath the Lost River Range's 12,000-foot limestone teeth to the north and lingering on the verge of the Lost River Desert's wide open expanses in every other direction.

In 1949, the Atomic Energy Commission seized 890 square miles of open space in Southeastern Idaho, a vast portion of the Snake River Plain's eastern region known as the Lost River Desert. In its entirety, the Snake River Plain sweeps across Idaho's southern square jaw like an open-mouthed grin, extending from the volcanic calderas near Wyoming's Yellowstone National Park to the Oregon border, roughly 250 miles long and 100 miles wide. It is a galaxy of open space, a landscape existing in the imaginations of the men charged with the duty of locating the world's first Nuclear Reactor Testing Station as other-worldly for its isolation. The Atomic Energy Commission called it a sanctuary, the place where the peaceful atom would assuage the military's hunger for more powerful bombs and more efficient electricity. It was called a home for the dutiful pursuit of technology, for the noble atom and its splitting.

In the Spring of that same year, my grandfather quit the cobalt mines in central Idaho, where they mined the metal that would create a “salted” atomic weapon, and bought the old forty acre homestead in the Antelope Valley near Arco, about fifteen miles northeast as the crow flies from the first Experimental Breeder Reactor (EBR1), the reactor that would light my father’s one room cabin with magical light—the result of the world’s first successful experiment with nuclear fission. My father spent the majority of his childhood on that homestead, in the shadows of Leatherman Peak’s lean physique, in the silent presence of nuclear reactors.

On the evening of December 20, 1951, a bare sixty-watt incandescent lightbulb, dangling from a chain above my father’s dinner table, flickered and popped. Inside their tiny one room cabin—with its already sagging logs and chipped chink—squatting in that remote homestead near Arco, my father sat motionless at the dinner table, eyes searching the black beneath the dead bulb. Steam rose from the plates of fried chicken and potatoes, snaking past my father’s nose to creosote stained rafters. His chair creaked, interrupting the hum of a hot fireplace, the screeching of the naked-limbed aspen on the window. Nobody spoke. And in that brief moment of utter blackness, with the stealth and hush of a midnight snow, the world had changed.

By the time my grandmother rose from the table and shuffled across the pine-plank floor to the cupboard to retrieve a bulb, my father’s five-year-old eyes could have picked out the shape of the moonlight slanting through the west-facing window, the hot glow of the pot-bellied stove, the sharp lines of his father’s jaw still working on his meal.

Had they all known, back in 1951, in that isolated little cabin in Idaho, that theirs would be the first home lighted by nuclear fission, maybe they would have eaten their chicken by moonlight, or lit a candle and gone to bed early. For when my grandmother flipped the switch—hot with nuclear energy—my father’s five-year-old eyes adjusted slowly to the soft glow of the white filament, to find his tiny world illuminated as revealed by the atom.

Between 1950 and 1963, when science was king, nuclear physicists on military payroll ordered the construction of some fifty nuclear reactors. All of the reactors were built to test what would happen under certain conditions; they were built as technological idols. My father lived ten miles to the west from two of the reactors. Even when he went to his elementary and middle school, he was within fifteen miles of at least ten more experimental reactors. One of these reactors, the SL-1, was the site of the most hazardous and deadly nuclear meltdown in US history.

The site of the SL-1, a small reactor built as the prototype of a fully mobile nuclear energy plant, was located twelve miles from my father’s home. When the reactor went critical, it claimed the lives of the three men working inside the control room. In total, 4,000 times the amount of radiation released in the Three Mile Island incident escaped from the melted-down core. My father was mid-way through his freshman year in high school on that cold January night. The next day at school, he heard nothing of the accident. He may have wondered why the sudden influx of planes buzzed the sky night and day—the planes sent to collect air quality data—or perhaps why the two-lane highway had been closed. But he heard no hint of trouble—the

dreamy little town remained quiet, as usual, and would stay that way for many years before the news would break.

My father was a carpenter by trade—some say a gifted craftsman—and a man who believed that hard work could fix almost any problem, which seemed to reflect the popular attitude of the men who grew up at the edge of a nuclear inspired landscape. He chose the place he would raise his family with care, a scrap of land on the opposite side of the Snake River Plain from where he grew up, some fifteen miles from the Nuclear Testing Station. From there he could still look out the front porch to the clean line of land that had been the backdrop for all his memories. The acreage was situated just west of the Snake River, near the small town of Blackfoot, out on the eastern fringes of the Lost River Desert, where the Wolverine Range's methodical lines and bunched-up foothills break from the flat eastern plain, and where the western plain stretches out deep-space wide, a landscape washed flat by the ancient flooding of Lake Bonneville, a basin interrupted only by three volcanoes: The Twin Buttes and the Big Southern Butte. As a young man, I spent many nights watching sunsets with my father. He loved this landscape more than I can possibly know, and, since I loved him, I loved it too. The Atomic Energy Commission chose its place with care as well. At that time the Lost River Desert must have seemed like its own country, cut off from nearly everyone and everything, a place most easily defined as vacant, desolate, absent, forming the kind of austere beauty that inspires pilgrims, prophets, devil worshippers, vagabonds, or wanderers to seek clarity among its broken basalt beds and wind-burnt sage flats. In

addition to isolation, the commission also needed an eager workforce—men who would put their heads down and go to work, who would find contentment in a good, steady paycheck, who would resist asking too many questions. They found this workforce in the little agricultural communities nestled along the Snake River, a short bus ride to the Nuclear Testing Stations. Here they also found men who placed high faith in their government and the political process which allowed them free worship of their god, men who reasoned that if the atom would one day destroy the world, it would happen by the will of God's plan, fate.

I am five years old. I peer out our west-facing window to see my father walking in circles near the edge of the garden. I press my nose against the cold glass. I like the way my deep breaths fog-up the window, the way my father's image comes in and out of clarity. He studies the ground, looks to the house and to the shed, and settles his stare back to the freshly tilled earth. He carries a shovel across the broad width of his thick shoulders, his arms draping the handle. He kicks his pathway clear of rocks with the toe of his cowboy boot; his circles widen with every pass. And then he stops. He looks out to the open Idaho plain and squints into the red October sun. He lifts the shovel from his back, positions his hands along its smooth handle, raises the spade slowly, and thrusts it into the plain beneath his feet. I watch him dig until my mother calls him in for dinner.

The following day, my brother and I play with our Tonka trucks in the shallow hole. We love this new playground because our tires leave deep prints in dark, damp soil. When our father arrives home from work in his little white Dodge, he walks to the

shed and appears seconds later with his shovel. He stands at the edge of the shallow, rectangular hole and watches us drive our trucks, leaning on the shovel handle. “Boys, why don’t you play on the dirt pile,” he says. So my brother and I move operation to the growing dirt pile. We are content to play trucks while he works and, for once, so is he. Every few minutes he throws a shovel full of dirt on one of us, and we run around the hole shaking the dirt off like we hate it. My father laughs as he continues to dig. He is red-faced and sweating; his arms are tight and knotted, veins poking through like taut cables. He doesn’t speak; he laughs and plays in the dirt.

One of my earliest memories takes me out west on Highway 26, heading across the Lost River Desert. Memorial Day. Each year my father would load us up and haul us across the plain to Arco, where his father was buried. About fifteen miles out of Blackfoot, a small windowless building rises out of the sagebrush, and one year my father turned off the highway and announced that we were going to tour the nation’s first experimental breeder reactor (EBR-1).

“Nuclear power came to Idaho first, boys,” he said, as he stopped the truck near the front gates.

“Oh,” we said.

We walked inside the maze of windowless three-foot-thick walls, lined with insulated pipes, glass-covered gauges, buttons, knobs, switches, colored light bulbs held in cages, switchboards, and “Do not Touch” signs. I listened to a man and his stories of atoms and remember isolated words and phrases: nuclear power, Russians, Cold War,

clean energy. I still remember the acrid air, the shuffling of feet on concrete, the pale yellow light. The red buttons. A place with so many unpushable buttons, unflippable switches, and unreadable gauges was a cruel kind of torture to a kid, and so we didn't stay long before heading back to the highway and off again to Arco.

After leaving EBR-1, I remember watching out of the open window as the sage passed, when I suddenly noticed a row of concrete blocks as big as houses stacked side by side. The row of blocks must have been a quarter mile in total length, and in each block was a round hole large enough that a semi-truck could have easily passed through it. The great blocks sat atop a mantle of level earth, maybe ten miles out on the plain. I poked my head out the half-opened window, letting my mouth fill with air, wondering at the giant blocks with holes in them. "What the heck is that?" I asked my father, pointing. He simply told me what I already knew. "Well," I said, "Why are they out there?"

"Target practice," he said, followed with, "for a big gun."

I held my head in the wind for several more miles, watching the giant blocks blown clean through. I imagined the size of the gun, how it must have been bigger than anything I had ever seen, how maybe even a push on one of those red buttons inside the windowless building might have opened up the earth to reveal the monstrous gun rising from the desert floor, and how pushing another red button must have fired the blasts. That's how it must have happened, I concluded.

As it turns out, my imagined gun wasn't too far from reality. A section of the nuclear testing grounds had been set aside for testing long range Naval weapons. On

subsequent trips to Arco, my father would later tell me that there were many days he thought we had gone to war. But the blasts, over time, became simply background noise.

In 1965, the Department of Defense mailed out pea-green booklets titled “In time of Emergency: A Citizen’s Handbook on Nuclear Attack and Natural Disasters” to most Americans who might be affected by the aftermath of nuclear warfare. President Lyndon B. Johnson’s stoic photo accompanies his comforting words: “It is already clear that without [nuclear] fallout shelter protection for our citizens, all defense weapons lose much of their effectiveness in saving lives.” Inside the brochure, drawings of mushroom clouds and fallout particles depict the cartoon-like reality of nuclear preparedness. Step by step diagrams of fallout shelters show the man of the house how to convert his basement or kitchen island into a sturdy structure where fallout particles and radiation couldn’t possibly penetrate. My father’s name was on the mailing list.

The root cellar-style fallout shelter is described as easily the safest, most economical choice for the conscientious man, its dual purpose appealing on two practical levels. First, for large garden growers it was an obvious choice, and, second, the food storage needed to wait out the nuclear attack would already be in place. Doomsday was coming, and it was the patriotic duty of all men and women to be prepared for it.

Meanwhile, dozens of nuclear reactors in our backyard were being melted down on purpose—the go ahead signaled by the meteorologists who studied the daily wind

patterns—and while my father practiced “duck and cover” nuclear fallout safety drills in elementary school, huddling with classmates tightly against a windowless wall, their noses pressed to the tile in fetal positions, military scientists rushed headlong into testing and building nuclear facilities. We had placed our sincerest faith in the technology that could win the Cold War, a countervalue war of unimaginable magnitude. The message was clear: we would win or we would die. And alongside this story rests the humbler stories of men like my father, who were growing potatoes and digging holes in silence.

I am five. I walk toward the enormous hole that my father has been digging for nearly a week. I stop at the edge. My father turns and looks at me. We are eye to eye. His veins bulge beneath his temples.

“Want to help,” he asks. But before I can answer he throws a shovel full of dirt on my shoes and says, “Go play.”

I turn to push my Tonka truck up the mountain of soil. The dirt is cool and dark and musty.

A day later, it occurs to me that digging the hole has become as routine as eating his dinner.

I walk again to the edge of the rectangular hole, crunching my way through the dead potato plant vines, and I am taller than my father. I look down at him to see the sweat trickling from his hair to his face. He looks up at me.

“What are you doing,” I ask.

“Digging out a root cellar, for the potatoes,” he says,

“Why?”

“Where do you suppose we’ll put all your mother’s potatoes this winter if I don’t?”

He smiles, turns, and bites the earth with the spade. I watch his body move with his work, his thick arms and strong hands plunging and lifting. I love to watch him work. I can’t pretend to know the silent fear that compelled my father to build that fallout shelter, but I do know that he built it with a singular presence of mind. I remember him lowering the sweet and bitter smelling railroad ties into the hole, used to line the dirt walls, and the hum of his drill working late into the night. And I remember him covering the gently-sloped tin roof—rising just a couple feet above the ground—with a few feet of topsoil. I mistook his demeanor like I should have at that age, but all the cues were there. Something that had remained invisible to him for all of those years became suddenly visible.

I know now why my father called the odd little building in our yard a root cellar and not a fallout shelter, and that he wasn’t playing in the dirt. I know now that this was simply keeping with the silent ache that defined that time, in that place. I know now that our dreamy little community, living in blissful reverie next to a cutting edge nuclear test site, didn’t want to know what went on out there, out on the plain. I know now that we all lived on the brink of conscious reality, and any subtle shift in the daily horoscope could threaten to take us over the edge.

Perhaps that shift would come later for me than for others, for my father's death was too tragic on its own to think about its connection to our beloved landscape. But questions about my father's death did surface and I began searching for those connections. I wandered the Lost River Desert with my brother, the place where we learned the most from our father, in search of answers. I visited the one room cabin and EBR1, read the only books available on the subject, mostly written by or paid with government funding. I found the usual, hollow half-truths. I filled internal emptiness with even emptier information.

My brother and I would often go out to the desert. We searched for answers in our own ways, usually as we drove beat-up cars through passages in the lava beds where sage does not grow. Years ago, before we had families of our own, my brother appeared on a warm summer night, just after the moon had risen, arriving in a car that had recently been up on blocks, literally, in somebody's front yard.

So on the nights my brother appeared with the blue Nova, I knew the desert had called him out. He had drawn flames on the hood with black model paint, and had etched in the center, in snaking whisps, *The Death Ride*. He had packed the back seat with Pabst Blue Ribbon. With death riding on the hood and beer in our blood, we struck out for the great open landscape of our youth.

Our desert runs took us straight out on Highway 26 from Blackfoot, past the rows of potato cellars, the grain elevators, and the last drop of gas for 150 miles, out toward the Nuclear Test Site and Atomic City and Arco. We would turn off the highway where the asphalt fades to gravel to dirt to the broken lava beds, and where the

landscape fades from lush, irrigated fields of wheat and potatoes, to gnarled basalt, bunched timothy, sage, juniper, cedar. For a few more miles, the path climbs and dips with each deep pocket of lava, then ascends one last time, hairpins south, and lengthens out atop a volcanic plateau.

My brother sat on the windowsill and rested his shotgun on the roof. He wore a Spuds McKenzie sweatshirt, the sleeves hacked off and frayed around the collar, faded 501's, and black steel-toe logger boots, the steel exposed on the right boot.

We had found a familiar trail toward Atomic City, just southeast of the Big Southern Butte, to drift along. You can still get a glass of beer in Atomic City, and that's why the twenty or so locals seem to stay on. Or maybe it's just that atoms go better with beer. Atomic City is where you will find the closest connection to people still living, more or less, off of the land. Mid-way to Blackfoot or Arco, situated just a couple miles from the main testing sites, and a good jaunt from the two-lane highway, Atomic City holds an anachronistic simplicity. When we arrived, my brother snaked his skinny torso back into the cab and rested the shotgun on the seat.

We stopped at the The Twin Buttes Bar, the only public building. Inside, it smelled like fried onions and beef. The linoleum was cracked and yellowed. A few flannel-shirted backs made a wall at the bar. We ordered a glass of Budweiser, the only beer on tap, and sat where the cracked and filthy west-facing window filtered the moonlight, lighting the grease and cigarette smoke—just enough atmosphere for a bar in the first city powered by the atom. Smoke 'em if you've got 'em.

I watched out the window, looking down the only fifty yards of asphalt in town. Main Street—a few rows of trailer houses, hauled out here during the Eisenhower administration, rusted-out Trans Ams and Rancheros, still running from time to time, cheat grass threading a bicycle frame and creeping up the side of a dead Maytag, the 1970 Ford pickup out front, with four rifles hanging in the back window.

The soft glow of the Atomic Energy Commission's laboratories filled the northern sky. I imagined the collage of lifeless, windowless buildings, a small city without color, with paved streets and road signs, long white roofs in perfect, ordered rows, hundreds of miles of fences and warning signs, the guard station close to the highway, the camouflaged soldiers with M-16's ready, locked and loaded.

To the west, I could pick out the small cluster of lights that makes up Arco, and I remembered the sign welcoming visitors to the first city in the world lighted by atomic energy, the numbers painted on the steep limestone crags to the north, commemorating graduating classes, Pickle's Place on Main street, where they serve-up an Atomic Burger, topped with mushrooms, the old closed down theatre, the school, the churches, the cemetery where my grandparents are buried.

For most of my life, I often mistook these communities for pastoral places of solitude. I overlooked the empty space of the plain, the space essential for nuclear work. I felt the isolation.

We left Atomic City. The cool night air worked its way through the Death Ride, arriving almost sugary to our lungs.

“I have been reading some, you know, in books,” I said, turning to my brother. “You ever wonder about what they do out here?” He chugged the last of his beer, crushed the can, and threw it in the back seat. He turned to me and cocked an eyebrow.

“I’m sure it’s mostly bad,” adding, “What do you know that you don’t tell me?”

“Mostly just stuff in books,” I answered, turning away.

“What do books tell you that you can’t figure out by looking around out here?” he said, holding his arm out the window, trying to catch the sage as it passed. “You don’t have to live long to know that some pretty bad shit happened from nuclear testing. I hear the same old stories about the poor bastards who lived in Las Vegas and Salt Lake City. I doubt we were spared. Everyone knows how screwed-up it was back then. Nothing happens. It don’t change it.”

I remember feeling at once the urge to explain all the statistical data that, in the end, proves nothing and the longing to inhabit his way of knowing, his ability to reconcile the past with the present.

But instead we both just listened to the low drone of the Death Ride as it wandered through the lava beds, leaving a blue tunnel of smoke and dust.

As we drove, I wished that I could erase what I know the books say. I wished that only the visible could define my ways of knowing this plain, this place that my father loved so intimately, but I can’t forget about the many stories that burrow beneath this desert alongside ours: stories of land abuse, pollution, fear, cover-up. I wished that I could look out at this clean line of land, let the sage stung breeze fill my lungs, turn my back to the lifting moon and watch as it lights up this sea of plain, and

know, clear-minded, that here I am home. I wished that these small moments were enough.

At the base of the Big Butte, on a foreboding night, the Death Ride did indeed meet a great and sudden death. By then the front bumper had been secured with chicken wire, the hood lag-bolted down, the flames filled bright orange. The glass had all been broken. But it could not climb the twisting road up the butte one last time. And so my brother took from its glove box his long-barreled .44 Magnum and loaded the big pistol with six brass bullets. We paced off ten feet and turned to face the heap of luminous blue metal, with its orange flames licking the hood. Then we took turns blowing holes into it. And we agreed, when the report from the last bullet had been sent and our ears had stopped ringing, that the Death Ride belonged out here.

Stretched out on the still warm hood, I thought that if we just could have kept going, past the buttes, past Atomic City, past the breeder reactors, past Hell's Half Acre, past the big secret government laboratory, past Arco, just kept going until all the gas had burned to ozone, and the lava had chewed clean to rim, the desert might clear our conscience.

There is the fallout that never happened—the fallout that we were prepared for—and the fallout that we could never have prepared for.

When I imagine the image of my father seated beneath the bare bulb, in blackness, he somehow knows. He's heard the story long before it was made, before

that story emerged as the master narrative of a landscape and its people, before he became that voiceless character on whom the story depends on keeping quiet, before the voice of the narrator defines the relationship of hero to villain, good to evil, right to wrong—the voice that would link a chain of totalizing binaries and would thus form the language and story of the Atomic Energy Commission’s Nuclear Reactor Testing Station: The dutiful story of the peaceful atom. I like to imagine my father still in darkness, his eyes searching the mostly invisible present, while mine search the mostly invisible past. I imagine we’re part of another story set in the same place, a subtext to the master narrative.

The fallout that did occur is found in the silencing of an entire population whose dependence on government money, government information, and, ultimately, the univocal voice said to speak for us all.

The local population has adopted the following mantra with regard to the nuclear testing grounds: *That of which we do not speak*. So now you are finally speaking.

The part of that story that is rarely told begins with a list of scattered and mostly hidden facts: Nuclear waste fills a one hundred and forty acre landfill, buried in caverns somewhere beneath the surface of the Atomic Energy Commission’s 890 square miles of plain, home to seventy-five percent of the transuranic waste in the United States; that radioactive isotopes have been found near the aquifer where our family pumps its water; that there were intentional radiation leaks between 1957 and 1963, measuring

an astonishing 4,000 times the amount accidentally released during the Three Mile Island meltdown in 1979. The story ends with a more mysterious conclusion: By the time my father had been stricken by the cold fear of nuclear reality, the silent work of the atom may have already performed its merciless work.

Idaho's Atomic Cities, God's Time, and the Apocalypse

The value of a historical product cannot be debated without taking into account both the context of its production and the context of its consumption.

—*Michel-Rolph Trouillot, Silencing the Past: Power and the Production of History*

If the radiance of a thousand suns

Were to burst at once in the sky

That would be like the splendor of the mighty one.

I am become Death

The shatterer of worlds.

--*Bhagavad-Gita*

I grew up in a nuclear landscape. My father and mother have never known a place to call home that did not include the presence of nuclear laboratories and the attendant cultural pageantry of secrecy. We all called it by the common euphemism: "The Site." Whether directly or indirectly, our lives growing up on the edge of the Lost River Desert, near the banks of the Snake River in Southeast Idaho, changed as a result of what happened out there. And yet the presence of the nuclear testing facility was no more remarkable than any other place of employment, and in some ways even less remarkable because we were only reminded of it because of the daily convoys of yellow

Site buses, carrying our mothers and fathers, brothers and sisters, in and out of the desert each day. What went on out there was never something to wonder about.

To begin that story, I have to go back to Arco, Idaho, 1951, and revisit the one room cabin my five-year-old father lived in. His father had just moved the family to Arco's Antelope Valley after the closure of the cobalt mines just north of Arco, near Challis. A millwright by trade, he thought he would try his hand at farming, and the land in Arco was cheap enough for an out of work millwright to buy 40 acres. During their first winter there, in the dead of winter, 1951, something happened in that one room cabin that only a hundred or so people can claim to have witnessed—their home was among the first in the world to be powered by nuclear fission.

This is a family story, and one that I have no doubt added to as it has been told to me many times and by many people who were not present in that one room cabin in 1951. As I look back on it now, and as I see this story in the full context of my life growing up in a nuclear landscape, I appreciate it how it unifies my family's history in this place, for the public persona of the place itself has never meaningfully evolved beyond the narrow definitions placed on the first city powered by atomic energy. Today, Arco is a city of a few hundred more or less permanent residents. It is about the same size as it was nearly 60 years ago, in other words, and the first sign welcoming travelers to the small town, just before they roll past the cemetery where my grandparents are buried, rests a big sign stating proudly: "Welcome to Arco: The First City Powered by Atomic Energy."

In the age of identity branding to appeal to the tourist consumer economy of the American West, these historic moments serve multiple purposes. Indeed, one can settle down to a nice meal the only open restaurant and order an “Atomic Burger” at the iconic *Pickle’s Place*, topped with, of course, mushrooms. On my last visit to Arco, a Memorial Day tradition in my family after visiting the family graves in Arco, I sat down at Pickle’s Place and ordered the Atomic Burger. And, thinking about this project, I bought a coffee mug with “Pickle’s Place: Home of the Atomic Burger” etched in green beneath a dancing pickle, an American flag, and the state of Idaho displayed on the other side; God Bless the USA wraps the bottom of the cup. It now holds my pens on my desk.

Between my father’s story and the city of Arco’s proud displaying of this sign, some 60 years after the fact, rests the master narrative that unifies the small world of an isolated Idaho town to the broader cultural artifacts of the Cold War in American history. While the story itself has become part of my family’s mythology and for the city of Arco, I also think that it provides a critical opportunity for understanding the identity of the place rooted mainly in conflict and change rather than permanence and continuity. As the sign and the local economy rallies to capitalize on its important moment in time as a way of setting in concrete the importance of this place.

As Douglas Reichert Powell suggests, “[Place] is always at some level an attempt to persuade as much as it is to describe. Because of the set of relationships intersecting at any one point on the landscape is potentially unsummarizable by any one account, all versions of region are necessarily partial, and hence an attempt to persuade, at the very least, of the validity of their own particular definitions” (21). Applying Powell’s analysis

specifically to Arco and the building of the other atomic cities is important because Arco is far from being unique in the commonplace practice of identifying its geographic and cultural place in history by a moment turned to great national, and even world importance, where we can say with clarity that something profound changed that day and that a moment had been claimed forever. The interconnectedness of experience and the complexity of events that culminate in any moment belong to a web of intersecting happenings which converge in crisis situations. The place, though dominated by certain world views, is integral to the timing, tension, conflict, and the opportunity presented.

The contemporary celebration of Arco and the Lost River Desert's importance in a time of great national and international conflict seems more to me like a veneer of permanence than an authentic one. For "Proving the Principle," as many local papers would sell the Government's secret experiments, was a campaign meant to assuage public fear in a time when technological advancement had surpassed human understanding. Viewed this way, the strategy of identifying place can help us connect finite moments of unique conflict, tension, and crisis to the broader patterns of development by discovering how these moments make connections through a web of time and through the disparate places, both materially and metaphysically, they create and are created by.

The Cold War, as an idea, created whole cities and communities dependent on virtually limitless defense budgets. Arco existed on the map before the Atomic Energy Commission came to the Lost River Desert, but just barely. Arco is one of those remnant

towns from a time in Western American history that started with the intoxicating dream of free land and limitless opportunity. But once the inexhaustible landscape became suddenly exhausted—the mines mined out, the water dried up—Arco lost its luster as dreams turned into slow realities. Arco became that familiar Western enclave of people dedicated to seeing their hard work through to its end as they managed to survive on the edge of the expansive Lost River Desert and the 12,000-foot peaks of the Little Lost Range. For my grandfather, however, Arco must have represented a place to reimagine his life and occupation in a landscape undetermined to define a right way of doing things.

The Nuclear Reactor Testing Station (NRTS) brought with it funding for hospitals and good schools and movie theatres to depressed places like Arco. It brought jobs for low-skilled workers, offering good salaries and benefits, something unheard of in that part of the world. An implicit enculturation began its course, which was imparted in largely by a set of mythologies. As the great Western writer William Kittredge describes, “mythologies and community stories shape societies. A mythology is a story that contains implicit instructions from a society to its members, telling them what is valuable and how to conduct themselves if they are to preserve the things they cherished” (*Taking Care* 52). Indeed the convergence of the Cold War narrative on economically depressed and marginalized populations, in the forgotten nowhere places of the West, and the people ready to believe this new mythology, suggest that what ultimately happened there could have only occurred in that place and in that time.

The implicit mythology that governed the Idaho nuclear landscape did not include instructions about asking questions and thinking in generational time. Had the instructions encouraged criticism and critical thinking to accompany the darkest decades of deceit, secrecy, cover-up, and deliberate harm of innocent civilians that this country has endured since the Indian Removal Act, perhaps it would not have endured so long. However, the cultural residue of proving the principle endures on coffee mugs and on restaurant menus. It endures in the mythology of the place that sells the only harmless things to come out of its decades long trip down that dark hall of smoke and mirrors we know as the Cold War.

Building the Atomic Cities on God's Time

When my father was three months old, August 31, 1945, the Arco paper, *The Arco Advertiser*, covered a story about the largest non-nuclear explosion tested at what was then called the Naval Proving grounds, where the Nuclear Reactor Testing Station would soon be built. It is titled "Huge Powder Blast Rocked Wide Area," and I will quote from it here because I want to capture the specific language:

A huge chocolate colored cloud of dust, shaped like a mushroom, followed by two muffled thuds, was what a large group of Navy and Army officials, scientists, photographers and others experienced Wednesday morning when a cache of 250,000 pounds of TNT were exploded on the desert near the gunnery range. For several days all of Eastern Idaho excitedly awaited the blast, as this was the

largest collection of powder ever set off by man.... The huge cloud of dust seemed to hover over the spot for about ten minutes and gradually moved westward toward the Arco community, as the air currents destroyed the symmetry of the cloud and it began to resemble a huge dust storm.

While I think the coverage of the blast speaks for itself, I do want to focus on how these events seem to build excitement in a community that should, using our contemporary sensibilities, bring shock and horror at the immense cloud of pollution about to rain down on the community's schools, churches, and hospitals, and the one room cabin where my newborn father lay helpless. Here it is treated as an honor to have been witness to this moment when man would blow something up in a more powerful way than he had ever done using conventional bomb material, which is a prelude to suggesting that the right time (from a historic perspective) to build atomic cities was the post WWII era. One can hardly imagine a scene such as the one described above, where explosions became so commonplace as to become background noise unworthy of even interrupting a good conversation.

Underlying many concepts of time and how we perceive it is the assumption that moments that define places and change them in some profound way could not have happened at just any time, but rather through contexts that converge and that bring about the opportunity. The Atomic Energy Commission (AEC) took notice of the public excitement surrounding the blast as it searched for a new home for its Nuclear Reactor Testing Station. The Lost River Desert's welcoming of such a blast was an encouraging

demonstration for the requisite secrecy needed to carry out nuclear experiments.

Considering the timing of the event, however, there is an equal degree of importance.

There are two main considerations at work. The first is found in the cosmological sense of timing—the idea that God had chosen at a specific time to enlighten his chosen people with this awesome power to first deliver them from the hands of the enemy and second to supply a boundless source of energy for America foremost, but possible for the planet. The second consideration of time is more qualitative in nature when viewed from the American patriotic ethos, marking the jubilant and victorious end to a popular war. The atomic bomb and the science that produced it was thus considered divine and good for America and American idealism, and that idealism provided the perfect timing that would see the construction of the atomic cities through, and no clearer example can be found than the proposed Nuclear Reactor Testing Station (NRTS) in the Lost River Desert.

In the idea of God's timing and the human capacity to harness the power of the atom, which turned out to be quite influential in American culture after WWII, Mathew Glass writes:

“The bomb” came to play a fundamental symbolic role in American culture. For both supporters and foes, nuclear weapons represented far more than a pragmatic response to the bifurcated postwar political order. As Robert Oppenheimer recognized in the searing heat and light emanating from the Trinity explosion, nuclear weapons seemed to bridge the gap between the human and the divine. Such power challenged existing views of the sacred,

requiring Americans to incorporate the new destructive power into their religious worldviews. (255)

Indeed many residents of Southeast Idaho, those about to live in a nuclear and militarized zone with the building of the NRTS, from Arco, Blackfoot (my hometown), Idaho Falls, and Pocatello envisioned atomic weapons as divine providence to God's chosen people. The mainstream religion in the region (the Mormon church) dealt with the awesome power in primarily two ways. In the town of Blackfoot, for example, it is estimated that 75% of the population are (or at some point were) practicing Mormons. And so to many people in these communities they conceived that only through divine intervention would this scientific knowledge lead to such a discovery. Following that line of logic, surely God would not allow humans to discover such power if He did not want it to happen during what Mormon leadership in my community described as the last dispensation of time.

In Mormon theology, the idea that the Saints are living in the last dispensation of time on earth before the Second Coming of Christ is a constant presence—it shapes events in a way that is unique to this culture, for they, quite literally, seek signs that God is making ready to return and cleanse the earth of wickedness and begin His 1,000 year Millennial reign. The culture, in other words, promotes an interpretation of many world and national events through a lens that sees tsunamis and earthquakes as the fulfillment of ancient prophecy.

The theological dimensions of conceptualizing atomic weapons and research again are not necessarily unique to Mormonism in particular, for many religious world

views include the belief in the destruction of the earth and a Second Coming of one type or another. The main differences that I see reflect the Mormon culture's unique and unqualified embrace of the technology as it relates to a specific view of time (or dispensation as it is known) and the events that would usher in the Second Coming. This embrace is also interesting given the complicated and violent history early Mormons experienced with persecution, much of it instigated by local and regional governments, in addition to their practices against federal and state laws such as polygamy. The federal government has not always been a friend to Mormonism, in other words, and a deep suspicion of secularism and a fear of being stripped of personal and religious freedoms pervades the culture even today, but particularly so during the mid-nineteenth century.

Armageddon and The Apocalypse

I turn now to Sharon Crowley's sustained discussion of what she terms "apocalypticism" in *Toward a Civil Discourse*, for it reveals clues as to why the "fundamentalist" Christian view (an accurate placement of Mormonism on the Christian spectrum) embraced the government and its atomic policies during and after WWII. Clearly there are elements of the federal government's active opposition to socialism and communism that spoke to the core values of the Mormon culture in particular, but also to evangelical Christians. Crowley notes a 2004 *Newsweek* poll which suggests that fifty-five percent of Americans believe in the Rapture, and that a surprising seventy-five percent believe in Satan.

According to the same poll, thirty six percent of Christians “believe that the Book of Revelations contains true prophecy.” But among fundamentalists, that percentage jumps to ninety-three percent.

In Revelations this end time’s narrative of calamity, war, and the earth’s ultimate destruction is referred to as Armageddon—the opening of the Seventh Seal. Crowley goes on to suggest that the vision of an apocalyptic end to the world has become so pervasive and even popularized in the American imagination these days that some end times narratives “may have become commonplace independent of Americans’ religious affiliations” (104). This more secular trend, however, is new to the American scene as it has played out in Hollywood and the popularized end of the world Mayan predictions of 2012.

Crowley cites Lee Quinby’s *Millennial* to suggest that there are two guiding principles regarding apocalyptic versions of the future that seem to resonate between religious and secular versions of the end times narrative. Apocalypticism, according to Quinby, suggests that “a supernatural or exceedingly powerful force, like nuclear disaster, for example, will bring world destruction ... and that an elect number will be granted a new, transformed, earth” (qtd in Crowley 106). This duality concerning an apocalyptic future is important to understanding the relevance of God’s time as it applies to this particular place and time because either version reinforces the AEC’s vision for the future in transforming the Lost River Desert into a nuclear wasteland. Either view forward the goal of a pre-determined sense of time, where the Idaho desert

becomes not just the backdrop for these events, but rather the destined or perhaps even the coincidental catalyst for making the events happen.

Thus this vision of the Lost River Desert as a place to stage the end times narrative seems particularly connected to the following passages in Revelations:

The seven angels that had trumpets now made ready to sound them. The first blew his trumpet and, with that, hail and fire, mixed with blood, were dropped on the earth; a third of the earth was burnt up, and a third of all trees, and every blade of grass was burnt. The second angel blew his trumpet, and it was as though a great mountain, all on fire, had been dropped into the sea: a third of the sea turned to blood, a third of all living things in the sea were killed, and a third of the ships were destroyed. (8:6-10)

While Crowley notes that, “scholars are the only people who are interested in situating Revelation within its first-century context,” she goes on to point out that “Apocalyptic Christians treat its prophecies as transcendental truth in spite of the fact that their application to historical events must be continually updated” (107).

Growing up in this culture, I heard often that the newest generation would not suffer death, but be risen in rapture when Christ returned to reign over his chosen people. That story has been handed down since Mormons formally organized in the early 1820s. Such situating is evident in the secular end times predictions as well—one need only do a sweeping Google search for the “end of the earth” or “Armageddon” or “Apocalypse” to discover that this narrative is continually being updated to reflect the times. At any given moment, one group or another across the secular/religious

spectrum has interpreted the earth's history within the context of recent events and has predicted the time and place for the pending apocalypse. When these predictions fail, as they always do, and sometimes in grand fashion, one might assume that part of that vision of the future would weaken as a result, or, at the very least, be compromised—that such predictions would be relegated to the same set of fringe beliefs characterized by Bigfoot, flying saucers, and alien abduction accounts. What seems to endure, however, is the purity of the Armageddon/apocalyptic narrative. Man may falsely predict the day and the time and the place, but that fact holds little sway with the power of the story itself. God's time is undisturbed by man.

In this way, “the philosophical and political consequences of premillennialist thought can hardly be overstated: human efforts to effect changes for the good are not only utterly futile, but by definition contrary to the divine plan” (Crowley 111). Clearly, then, there could be no more opportune moment for the Atomic Energy Commission to seize 400,000 acres of Idaho desert than in 1949. No opposition would be voiced by groups living in the would be atomic cities (at least publicly), and there was little chance of that happening to begin with. The time had come to the Lost River Desert – a time to build the fortresses of good against the ideologies of the evil. The struggle between good and evil would play itself out on the sweeping sea of basalt and sage as prophesied by early Mormon prophets. The Saints, the prophets witnessed, would be tested and would be called to hasten in the final days. In this case, I can think of no greater resonant event than a proposed nuclear testing site. Apocalyptic thinking governs the

way such a proposed place of research and experimentation must be interpreted.

Indeed, Crowley goes on to argue:

Apocalypticism conjectures the world as an eternal struggle between good and evil. Humans are pawns in schemes developed by the forces of evil, while the moral fiber is tested by discerning the positions that should be taken on difficult issues, the geographical sites of which are often far removed and the disposition of which is not controlled by ordinary people: who is an enemy, what role should be assigned to which groups as events unfold, which international policies will hasten the advent of the apocalypse. (127)

This argument takes on significant meaning when applied to the AEC's plan to build a nuclear testing site in southeast Idaho. For the plan to align with these very rigid Mormon values of eternal strife happening in real time in their backyards, a clear path to acceptance had to be in place. Of course the economic implications for the region governed most of the public discourse, but in the many halls and meeting rooms of Mormon churches, and in the homes of the men who would eventually work at the site, a more complex conversation converged around the place: what was good and what was evil, and how specifically this community had been "called" (a commonly used term in Mormon culture to reference the divine act of choosing people and places to serve in capacities that often require excessive self-sacrifice) to bring this new technology to fruition. There was little more to understand.

Indeed by the middle stages of the twentieth century, Mormon theology came strongly in line with the patriotic ideals of American Christian theocracy. This shift came

in large part as a rise to the national Christian-based ideology of American exceptionalism. *Newsweek's* ninety three percent statistic presented earlier resonates with my own experience in the Mormon culture— and, if anything, I think it would be higher if only active and practicing Mormons were polled. And while I can only speak for the latter portions of the nineteenth century, there is little doubt in my mind that this number would hold out among the many practicing Mormons living in the proposed atomic cities where I grew up. At that time, in fact, the density of the Mormon population would have been higher than it is today, again with an estimated seventy-five percent of the population in the city of Blackfoot. Earlier I spoke of Kittredge's notion of mythologies as an implicit set of instructions for how to live. Here I would like to add to that notion with Crowley's more explicit definition of apocalyptic ideology in fundamentalist culture:

Densely woven ideologies articulate identities for individuals as well as for communities of believers. Such ideologies resonate for believers at a visceral level because they connect intimate experience of life with larger questions and issues. A tightly articulated ideology can smooth over contradictions that might give rise to dissonance or doubt because it has a ready response for every possible occurrence. (105)

The larger question and issue for the populations of the atomic cities are (or rather should have been) many, but the ready response, as Crowley articulates here, presents a clear path to accept or reject, support or oppose, nearly every event that demands a decision. One might argue at this point that the Mormon culture did not really have a

choice in becoming a neighbor to a nuclear testing station, but that argument suggests Mormons were passive in the location of the nuclear testing station, one way or the other, when in fact nothing could be further from the truth. Mormon culture can give rise to strong and cohesive opposition when their ideals and, perhaps more importantly, their places of worship (what they call Zion) are threatened. The 1979 MX Missile controversy (discussed in detail later), which would have brought an influx of defense missile installations along the western border of Utah, is perhaps the most current and connected evidence to suggest that the Mormon culture is not only willing but capable of resisting unpopular government action. The threat of locating the missile defense system in this particular area of Utah was a threat to the sanctity of Brigham Young's Zion. They were successful in stopping this military installation that many suggest would have been built had they not intervened.

Far from passive, Mormons in southeast Idaho were active in building the atomic cities, and this active courting of the AEC to Idaho speaks to the culture's embrace of the new technology as a natural part of God's order according to God's time, but also validating that the place itself held specific importance to the ordinal timing of God's return to begin the millennial reign.

As it turns out, there were only two locations seriously considered for locating the new testing station: The Lost River Desert in Idaho and Fort Peck in Montana. While the story of the AEC's decision to locate the testing station in the Idaho desert is an interesting and instructive one, for the sake of space and clarity I will add only a brief summation to suggest how locals hotly contested the location of the nuclear testing

station in Idaho and Montana, as both states not only accepted the patriotic mission of the nuclear program, but they also understood the immediate and long term economic implications suggested that the “500 million that the AEC said it would spend on the site was greater than the assessed valuation of the entire state of Idaho” (Stacey 30). While that assessment may have been hyperbolic, it suggests the opportunity that such an infusion of money might mean to a rural state such as Idaho. For the prospective atomic cities, the nuclear testing station represented the boom of all booms, and this one seemed likely not to bust.

The would be atomic cities in Idaho put on quite a show for AEC officials, making promises to build infrastructure, housing, businesses, schools, airports, and churches to accommodate the influx of nuclear scientists and workers. Idaho Falls, which eventually would be chosen as the AEC’s headquarter city, much to the dismay of Arco residents, almost immediately dubbed itself “The Atomic City”. An internal memo from the mayor of Idaho Falls to the Greater Idaho Falls Committee, which led the campaign to locate the AEC headquarters in that city, writes to the chair, who he calls “Atomic Mac,”

Assume Idaho Falls must provide all it has and make immediate plans for adding what is needed that it does not now have. Boost to high Heaven the things we do have, ie: Hospitals, churches, schools, parks, golf course, shopping center, etc. etc. Enlist and encourage industry, individuals and groups to get working immediately to provide the things needed that we do not have: living facilities, office facilities, highway facilities.... Do everything possible. (Groberg *Internal Memo published in Stacy’s “Proving the Principle”*)

Montana reportedly had done its own version of the same, but in the end came up short, the AEC noting the eager work force in Idaho and the already viable communities in which the skilled workers and scientists could live and raise families. A sort of fictionalized welcome mat of what lay ahead for the AEC in Idaho Falls is evident in the memo.

However, there was a more circumspect rationale for locating the site in Idaho Falls and not the Fort Peck site. The AEC operated with a high level of secrecy and wanted, above all else, to be left alone by state and local governments, and by the people populating the newly established atomic cities. According to the Idaho historian Susan Stacey:

With no evidence to the contrary, the AEC had every reason to believe that it could continue its tradition of independent operations in Idaho. No opposition appeared anywhere. The government's habit of secrecy in atomic matters had originated during a patriotic war. With the growing threat of a communist enemy, secrecy would have to continue.... Employees would have to be checked and double-checked on their loyalty standing. Citizens seemed content to accept details about the testing station whenever Johnson felt free to provide them.

(34)

Embedded in this quote are three elements of this community profile that reflect the Mormon culture as the perfect cultural backdrop for the nuclear testing site. First, the habit of secrecy is a shared value in the culture. Second, Mormons feared the rise and spread of communism and felt an unusually strong patriotic civic duty toward the

American role in stopping it. Third, the Mormon faith is steeped in obedience to authority, particularly when that authority is male and deemed to be working under the divine guidance of God for the good of His people. Thus being on a “need to know basis” regarding all operations at the site was uncritically embraced, as the general attitude toward the work to be performed there was in one way or another divinely inspired. Plus, the massive influx of new, outside money to the region brought with it a strict code against “biting the hand that feeds you” outside of the Mormon culture.

Many of the rituals performed in the Mormon faith are secretive, even within circles of practicing community members. Ceremonies performed in Mormon temples are particularly secretive and only spoken of while inside the walls of their Temples. The long term effect of living in such a culture normalizes not only this behavior of keeping secrets, but also the necessity of the secrecy in preserving the sacredness of the practice. Whereas secrecy and the practice of keeping secrets is not normally associated with positive behavioral attitudes and socially acceptable decorum, being the bearer of secrets in Mormon culture is both necessary and celebrated.

The various secret rituals and practices themselves created a sense of empowerment for those allowed to participate and become the cultural bearers of secrets. It was implicitly understood in the culture of secrecy, in other words, that some things were neither spoken of nor asked about, and yet the secrets permeate the day-to-day functions on the conscious and subconscious levels. These are shared cultural values between Mormons and their new nuclear neighbor, reflecting what Robert Fuller suggests is a “deeper power at work behind the surface appearance of worldly events.

Everyday life viewed against the cosmic background in which the forces of good are continually embattled by the forces of evil” (qtd in Crowley 127). The active maintenance of a secret society situated the Mormons squarely on the side of good. Along with the secrecy, or rather as a condition of it, a culture of monitoring and suspicion naturally attended the lives of those who lived in the atomic cities.

From the AEC’s perspective, the culture of secrecy was proven effective in such atomic cities as Hanford to the North and especially in Oak Ridge to the East. When I was a young man, two of my uncles worked at the present day Idaho National Laboratory (formerly the Nuclear Reactor Testing Station). Their families, even their wives, did not know if they swept floors or built bombs. In some other community, that might seem odd to a boy, but to me it was understood that whatever work was carried out in the desert, stayed out there in the desert, and we never thought to ask about it. For most of us, the behavior was so commonplace as to be normalized into our everyday consciousness. For many others, the secrecy provided a sense of protection from outside the community, something familiar and comforting to the Mormon culture that finds their values and rituals in stark contrast to mainstream American culture. As Stacey noted earlier, there was no opposition to this level of secrecy in the proposed atomic cities.

The historian, Russell Olwell writes in *At Work in the Atomic Cities* that, “This consensus had several key elements: A concept of workers as surrogate soldiers serving their nation, enforcement of secrecy restrictions about work at their facility, and the prioritization of production speed over worker health and safety ... these embedded

rules set the parameters of civic history, limiting worker and community activism” (4). .
Indeed, the work, though secret, was infused with patriotism and sense of duty—so
much so that when I asked one retired worker about his time at the laboratory he said,
“You can’t imagine it now because of the way things have turned, but back then we
were excited about the work and knew it was important beyond just having a job. We
were proud, very, very proud” (Callister).

I will return to Callister’s story in another chapter, but his voice resonates here to
suggest the willingness in which the workers living in the atomic cities carried out the
work and engaged in the secret conditions of their employment, despite the risks they
may have faced on a personal level. Workers did not speak of work, question rules and
procedures, or the objective of the work—it was all assumed to be important to
national security and the good fight against the manufactured fear of communism and
the Russians. As Janice Harper notes in her essay, “Secrets Revealed, Revelations
Concealed: A Secret City Confronts its Environmental Legacy of Weapons Production”,
“keeping the secret also meant having housing and job security and avoiding the front
lines—which for many young men and their families gave incalculable value to a secrecy
...trusted as critical to the wartime effort” (43). Moreover, the secrecy was already so
acculturated in the Mormon communities that the political necessity and climate of the
Cold War seemed only to deepen the importance of a secret society and maintaining it
at all costs.

Thomas Howard reflects on growing up in Oak Ridge in the essay “Secrecy in the 50s” and suggests how powerfully the culture of secrecy had permeated the atomic city, especially after WWII had ended:

It was really after the war that secrecy in Oak Ridge became most pervasive. The gates and fences were gone, yet secrecy persisted in the everyday life of the 1950s in subtle and powerful ways. There was still a formal apparatus to prevent the development of public knowledge—loyalty, oaths, security clearance, lie detector tests, badges and so forth—but what was most effective was an almost unconscious conspiracy of silence in which secrets were protected by voluntary non-communication. This was a culture of secrecy, which extended even to matters that weren’t military or classified.... It was possible to grow up in oak Ridge and not have any idea how important a role the city continued to play in weapons production. (qtd in Harper 43)

Growing up near the nuclear testing site, I can relate personally to Howard’s sentiments here, particularly his insight that within these communities rests an unconscious seeming conspiracy of non-communication. Aside from a few off-handed comments I remember hearing from my father, who grew up all his life within 10-15 miles of the Nuclear Reactor Testing Station, I knew nothing of the site except that the great caravan of yellow buses would convene at the end of my road three times each day, out in the potato field country of Idaho, pick up our distant neighbors carrying lunch pails, and then disappear into the desert. There was something reassuring about the steadiness of the bus’ schedule and the men boarding the buses.

Once I remember my father stopping on our way to fish the Big Lost River to tour the Experimental Breeder Reactor-One, the first nuclear reactor to produce useable electricity. Even then I could not connect the importance of the enormous building filled with gauges to “the site” we passed each time we made the trek across the Lost River Desert. “Nuclear power came to Idaho first, boys,” he told us with what I know now as some air of pride. But even he did not know the extent of the work that went on during his childhood and beyond, nor about the secrecy and the cover-ups. Like the rest of us, he learned from an early age that asking questions got you nowhere fast in our corner of Idaho. We all lived under the rule of conscious and subconscious covenants—to God, to church, to family, to country.

David G. Brumley explores these covenant-based relationships in “Remembering the Future: A Sociological Narrative of Crisis Episodes, Collective Action, Culture Workers, and Countermovements,” where he argues that the most fundamental relationships are covenantal because individuals are no more than products of their communities. Individual value is placed on what the individual can perform for the collective good. Brumley goes on to point out that understanding the logic of covenantal social relations is in “terms of the way individuals shape their intentionality, structure their activity, and exert control over one another in this type of social relation ... individuals signal their intentionality through a process of vow-taking with a goal of reaching mutual commitment” (106). This sort of vow-taking does not have to be explicitly taken, although in Mormonism it certainly is in places such as the Temple, where sacred vow-taking rituals are performed between members. It can rather

manifest in the unconscious ways that secret social customs always have—through socialization and enculturation, the implicit instructions that tell a person how to act. Moreover, “Participants in covenantal social relations symbolize the larger whole of which they are a part as being ordered by spiritual/personal agency, such as the laws of God” (107).

The culmination of this chapter situates the Idaho’s atomic cities as the prescriptive audience for President Harry Truman’s theological rhetoric in the aftermath of Hiroshima and Nagasaki—tens of thousands of innocent civilians dead in seconds, two destroyed cities, and the unforgiving radioactive fallout. His audience was those citizens about to welcome the nuclear armada to Idaho’s Lost River Desert: “We thank God it has come to us instead of to our enemies, and we pray that He may guide us to use it in His ways and for His purposes,” said Truman in his national address. The nuclear age has been traditionally framed as arriving to the American cause in God’s time. Its arrival, however, obscures the places and the great concerted efforts that went into seizing the technology and pursuing it at all costs in the Idaho landscape, and obscures the complicit silencing of the people who call these places home. In this way, the ethic of *rightness* became something of self-fulfillment. If the technology could be made by the hands of man and perfected, then its ethic had already been proven, and the opportunity to use the atom for peace and wartime purposes was boundless and good and ordained accordingly regardless of the devastation left behind.

Even the agnostic science community found ways to imbue the birth of the nuclear age as a kind of bridge between human and divine powers. After witnessing the

Alamogordo desert lit up by a thousand suns, Robert Oppenheimer quoted from the *Bhagavad-Gita*:

If the radiance of a thousand suns
 Were to burst at once in the sky
 That would be like the splendor of the mighty one.
 I am become Death
 The shatterer of worlds.

Sometimes I think my father must have seen something like splendor when he witnessed the giant load of TNT hurl the earth thousands of feet into the air, near that isolated little town of Arco, Idaho. I also assume that he was terrified as a little boy among such chaos. Though the newspaper accounts focus on the excitement of the explosion, it must have produced anxiety and fear as well. Indeed, the nuclear age has always been celebrated dichotomously—as salvation or damnation.

In the Lost River Desert this dichotomy would play out in dramatic ways that seemed to fulfill the cultural imagination of the fulfillment of the pending apocalypse. As Steward and Harding suggest in “Bad Endings: American Apocalypse,” as a rhetoric [the apocalypse] is a strategy of persuasion and coercion that interrupts routine ... with a call of alarm.... As a distinctive narrative, it claims to be not just a story with a beginning, middle, and end, but *the* story about *the* beginning, *the* middle, and *the* end” (290). The beginning of that story can in part be interpreted as locating the Nuclear Reactor Testing Station in Idaho. The AEC had always selected its nuclear facilities in favor of isolation. They preferred building cities at cartoon speed (and quality) in places

like Los Alamos, Hanford, and Oak Ridge. They had not yet located a major experimental site near a populated area, with plans to use the existing infrastructure to staff the site, house the families, and bring roads, water, and energy to the facility. The types of communities and the potential manpower, according to Jason Krupar in “Burying Atomic History”, was the main concern along with infrastructure. The culture of secrecy and covenants appealed immediately to AEC planners as the right place, at the right time, and with limitless opportunity in the Idaho desert (35).

Of Mountains and Fathers

In the infinitely small moment of the present, all becomes uncertain and insubstantial. It takes time to know what's real and what isn't.

—John Rember, *MFA in a Box*

It was our first and last hunting trip together. I replay the day often in my mind, always searching for something new to hold onto. My father obviously didn't know this was his last hunting trip. Sometimes I wonder if, in some intuitive way, he understood something was different about this hunt. If I ever imagine how my father might counsel his adult son more than twenty years after his death, I repeat the subtle admonishment he gave me on the mountain, "don't try too hard. It's all in the timing."

I am falling behind. Your strides seem to get longer, while mine get shorter. I have been watching your broad back and careful steps for nearly a mile now, since you passed a hundred yards up the trail and said you might be able to see the deer better in front. You turn to make sure that I am plodding along, and I hurry to catch up. The mid-morning dew steams as the sun looks over the eastern ridge of Leacock Point. It feels good on my cold face and hands. I left my gloves and hat back at our camp on Panther Creek—wanting to be tough like you—and I wish now that I hadn't.

You stop at the first switchback, carved into the steep sidehill beneath the heavy bows of a douglas fir. The morning mist and our breath mix and for a time we stand silent, watching it lift with the warmth of the sun. Through the tangled cover of a stand of fir, you crouch to study a meadow near a small beaver pond. I raise my rifle to my

shoulder and pull back hard—just the way you taught me—and scope the pond, where the little brookies are sipping on the early morning mayflies. You rise without a sound and whisper that the deer must be higher. I nod as if I understand why.

The morning half over, the day just begun, we continue up the trail whose only travelers seem to have been the deer we cannot find. Slowly now, more warily, your steps fall lighter and your rifle swings side to side with your wide straddling steps, missing the cowbells that I step on. I hold my rifle as you do; I admire it as a boy who has never carried one in the wild and knows little of what it can do beyond exploding beer bottles and used oil filters. I had waited twelve years to learn about this place you talked about often. In some ways, it feels like I've been here before, even if only through dreams. In the dreams I think about how much tougher I am than my friends—how proud I will make you.

The trail switchbacks again to the east. The sun, now fully exposed, blinds my view of you, and so I watch it shine off of my new hiking boots. The new leather creaks with each step, and I remember that you had told me to wear them to school for a week before we left, but I didn't. I wanted them to be new and perfect for the trip. Watching the new leather shine and creak, I now know I should've listened. But they feel good. The weight of the rifles feels good, too, and I think that this must be what a man feels like.

Lost in my thoughts of boots and rifles and picking a path through the cowbells and limestone, I startle at the report of your rifle. I run toward the sound. I reach the top of the ridge to find you climbing back toward me. "Shit," I hear you say looking back

at the small meadow where you had fired. I don't know which is more shocking, that you cursed or that you had missed your shot. I have never heard you swear, though I cursed in the school halls with my friends, and I know I must look shocked when you look at me and turn quickly, pointing to a passage in the cliff wall that rose from the meadow, and telling me there were seven—two with antlers.

We're near the top of Leacock Point now, you say, as you pull the bolt-action lever back and ejects the spent cartridge. I smell the gun powder and watch you push another bullet into the magazine like I've practiced a hundred times but never seem to get right. You crank another shell into the chamber and look at me. "I'm okay," I say before you can even ask. You smile.

You say that we've probably pushed them over the summit where there is a wide-open meadow that looks like our hay field. You continue, walking a little slower, letting me catch my breath. You stop every so often to point out the landmarks on the trail, where you had carved your names on some of the trees when you were just my age, and even a giant fallen cedar where you slept one night when the weather caught you and a big buck without warning. This mountain can turn furious when the clouds sneak in from the west. Five minutes is all you get. Luckily, you say, the mountain lions didn't get you both.

You wave me to go ahead, "You can do it," you say, as I pass. I feel bigger, grown-up leading our way. The trail has had little travel, so when we intersect game trails you show me the "dot-slash" markings on tree trunks next to the Forest Service trail, and I wonder what more you will teach me about this mountain.

I pick my way through a grove of thick aspen and I feel your hand on my shoulder, pushing me down gently. I turn to look and see your finger at your lips. A crash through the timber startles me and I jump to my feet and rush toward the sound. I see two flashes of white. I slide a shell into the chamber and fumble with the safety and pull the trigger before I even get the stock to my shoulder. The kick nearly knocks me to the ground, but I manage to look up just as the two flashes escape just over the ridge. I hear your muffled laughter as you make your way to where I am sitting on the trail. I am embarrassed and surprised by what I had done. Before you reach me, I pull a bullet from my pocket and begin reloading the magazine, just like I'd rehearsed. I look up. "You've got good reflexes; that's for sure," you say, squinting into the morning sun. I run my hand down the barrel of my rifle, feeling the warmth from the blued steel—my first shot at a living thing. "You have a good aim, good reflexes. Don't try too hard." You kick my leg softly as you step over me and continue up the trail, looking back to add "It's all in the timing."

Over a small ridge and down another, the trail takes us to a clearing where the pine and fir create a framed opening to the Frank Church River of No Return Wilderness. You tell me it's the largest wilderness in the United States. "Right here is where I'd build me a little cabin, watch the sun light up this big country every morning. My backyard wilderness," you say, walking to the opening and standing in the doorway of the firs, stretching out your arms as if to claim this view and this place as your own. I watch you, a silhouette in the doorway to a world that seemed to have no end, rifle in hand, the sun on your face.

The summit is a few hundred yards farther, past a bald side hill and around a pocket of aspen, finally ascending to a rock-studded field of scattered sagebrush. Embedded in the highest rock at the highest point is a round, gold medallion. It reads: "Leacock Point," along with some numbers that mean nothing to me. You tell me that it is important, but also that you thought it just a bunch of numbers when you were my age.

Pointing to the open pasture on the opposite ridge two hundred yards to the west, you say the deer are bedded at the edge, waiting for dusk to eat in the uncommonly lush pasture of early fall. I follow you down to a fallen fir, its roots exposed like veins, where I discovered that we have had lunch reservations for twelve years now and our accommodations include a nap, shaded by the thick trunk. Lunch is Vienna sausages out of a can, an apple, and a can of Pepsi. When I saw you stuff the cans in your pack, I wasn't looking forward to eating them, but up here even Vienna sausages aren't that bad. You finish before me and lay out to sleep. I finish, crush my cans, and stuff them under a rock. I see your eyes open underneath the orange cap pulled over your face. I retrieve the cans and put them in my pack.

The afternoon is warm and sunny. I lie back in the grass watching the thin clouds and the occasional hawk. I pick up my rifle every few minutes and look through the scope, imagining that I see something move through the distant bunchgrass. Though we're far from our home across the Lost River Desert, the sweet smell of warming sage reminds me of the weekend afternoons we spent stretched out over the hood of your truck, shooting cans and bottles in the desert's deep basalt bed crevices.

I watch you sleeping, snoring lightly. I am just a boy, I know, but I feel like a man must when the sun is out and your belly is full and you call a mountain your own. I try to sleep like you, but I can't. I listen to you breath, to the breeze rustling the cowbells that I never seem to avoid. The image of you in the doorway of the firs, the way your heavy boots sound so much lighter than mine, and the way you know every ridge, every meadow, every tree makes me wonder if I will ever be that kind of man. I remember the stories you tell me from when you were a kid—how you ripped down the sign that stood at the trailhead of your mountain. When we pulled our truck next to Panther Creek, I noticed the sign had never been replaced, preserving, at least to our minds, a place where we could learn to love each other and the earth enough to know that a mountain could sustain both forever. This prose is dream-like, really interesting.

My thoughts are interrupted by the snap of a branch and the thud of hooves. I look up to see a buck making his way down the trail toward the meadow where the does waited in cover. I still hear you snoring and think about waking you but then think better of it. The buck does not seem scared or aware we are here. I reach for my rifle and remember to pull it tight to my shoulder this time. Breath, I hear you say. It's all in the timing.

By next fall you are weak and withered to skin and bone. At nearly thirteen, I weigh more than you do. The doctors say it is an aggressive and rare form of melanoma. I

don't know what that means, but I know it is terrible. It has rendered my father's arms, once the size of tree trunks, to twigs.

One late September afternoon you ask me to come into your room and sit next to the rented hospital bed, and I do even though I don't want to. The pain medication is so strong that most of the time you sleep and then hallucinate if you manage to stay awake. But you refuse the drugs on this day. Even just a boy, I see the pain in your eyes when I enter. I ask you how you are doing because I don't know what else to say. I sit down next to the bed, not expecting an answer.

"I want you to have something of mine," you say, reaching for my shoulder. The hand feels cold. "I don't have much," you continue, "but I think you should have something." I do not respond. I stare at the wall. I think about your wish as though every young man should have to consider what possession of their father's they would like to have. I think about all of your tools that I have used, broken, or lost over the years, your old white truck, your cherished 300 Remington, the rifle you had only let me shoot once because you didn't want me to be scared of the kick.

After a few minutes of silence, I say that I would like to have the 300 Remington. You manage the first smile I've seen in months and say, "thought so. Send your sister in."

The next day you pass away in your sleep.

Some years later I am introduced to the poet John Keats who writes that "We shall enjoy ourselves hereafter by having what we call happiness on earth repeated in a finer

tone and so repeated.” I am drawn to the simplicity of this poet’s version of the afterlife, and so I accept it as the only truth that makes sense.

Even with the passage of time, I am unable to shake the loss or the final images, the unfairness of it all, and I dream an old dream that begins.... When you wake you find that the deer are emerging into the meadow and they aren’t scared. You can get as close as you want. The little opening in the firs, where the Frank Church spreads out immeasurable, holds a small cabin.

I still visit you up there sometimes. I park my truck next to Panther Creek and pick my way through the underbrush to what once was a clearly marked trail. You and me and the animals are all that travel it these days, and so I often lose it and have made my own path in places over the years. I carry your 300 Remington out of ritual only—I have no intention of killing anything. I find our place late in the afternoons and rest my back against the ever-receding trunk. Sometimes I’ll wrap my hands around the walnut stock of your rifle and admire how my hands have grown to be yours. Sometimes I’ll squeeze off a shot or two at a branch or a rock near the meadow—just to see if I can still hit anything.

Other times I lie in the grass and imagine you there with me. Although all of my academic training tells me such a place exists only in imagination, and that you are not really there, but exist rather as a projection of my psychological desires, what is real and is unreal matters little to me when I am there with you on the mountain.

I am thirty-seven and you are forty-two. I am lucky, so I think, that you will always be 42 and in the prime of your life. You and I will never have a falling out, a bad

business deal, a disagreement over how to raise children, a tough conversation about how and where to spend your final years. You died before you could become anything but perfect. And though I know that story carries its own flaws, it is the only one I have and that is all my own. My understanding of this place relies on hope. It is hubris, I know, to say that a mountain can be anything more than what it is on a human scale, to claim it as mine and yours. But if a place can fulfill even the smallest of human sensibilities, it is the small hope that I learned from paying attention and caring for a mountain.

On the occasional afternoon, holding your Remington, I think this is the only place left where hope still resides. Our small world in the West has been mined out, dredged up, burned off, and thoroughly ravaged by Cold War experimentation. The 40-mile forest service road near Challis, Idaho, is all the evidence you need to support that our small world was once center stage for the most extreme search for power the world has ever known. And each time I drive the rugged road, I am reminded of that when I pass Cobalt, where your father mined the metal element cobalt that would, theoretically at least, create the “salted” atomic bomb, capable of even more devastating fallout. You lived near the mine in a wall tent for the first few years of your life, and your father worked there because he hoped to support his young family. The Western hope that Stegner once wrote about is only found in the small and good things leftover—like this place where we pay close attention to the simple beauty of the earth at our feet, where you and I talk and never seem to age, and where time is seen through generational ritual. Here I understand that it takes time to understand where real hope

lies and where false hope has proven itself to be an ever-refined promise that ends each time with ugliness.

And yet I feel fortunate that there's this place where I can go and where some things between mountains and fathers can always be good.

A Place for War, A Place for Peace: From Mountain Meadows to the MX Missile

The idea of place is a powerful concept in Mormon theology. Mormonism is in many ways defined by the places where the saints were allowed to worship as a group without persecution, and, in a very tangible way, the entire foundation of the church is built on the notion that an ancient prophet received revelation from God to search for the new Zion, “Promised Land.” This land would be the place where the new Zion would be built, and where saints could worship and live until the time Christ came to destroy the wicked and cleanse the earth, and thus begin His Millennial reign. This rhetoric suggests that in large part the interpretation of events happening in any place, sacred or not, and the specific beliefs toward these places, are first governed by a cosmological sense of God’s time and a secondary priority is to seize those moments of opportunity that hasten His plan and deliver his people. Given this view of place, the landscape itself becomes critically important to understand and interpret historic events.

The ancient story of Mormonism is obscured by the relative youth of the church. The church did not survive on American soil in ancient times (which is a very long and detailed narrative of wars between God’s people, the Nephites and the Lamanites—the Lamanites believed to be the descendants of modern day Native Americans). As the story goes, in much the same way that Catholicism weathered the Dark Ages, The Mormon church teaches that God withdrew his religion from the earth. A new prophet in modern times (1820) was called to restore the church once again in America – in a

time and dispensation when it would be accepted and when it could be spread throughout the world in preparation for the Second Coming.

A bit of backstory is required here to show just how fundamental the ideas found in American exceptionalism are to nearly every aspect of the Mormon faith, and especially to what extent place itself plays into that belief. In Mormon mythology, as recorded in their scripture titled *The Book of Mormon*, Lehi, a prophet living in the Old World of the Biblical New Testament, received revelation from God to flee the wicked city of Jerusalem and travel to the Promised Land. Much of the first half of the scripture is devoted to the trials and tribulations of this odyssey—from initial ship-building, to divisive familial relationships, and to the final landing of what is interpreted by contemporary Mormons as North America. There are many interpretations within the Mormon scripture scholars about just where Lehi and his family landed and established their first settlements, but it is generally accepted in the contemporary doctrine that they arrived in what is now North America. Many of these scripture scholars suggest that some of the ancient ruins found in South America are remnants of the ancient Lamanite tribes found in the narrative accounts authored by several different prophets on gold plates.

In the prophetic accounts that follow, the church endures periods of peace and war, wickedness and prosperity, but in the end the earth is shown to be too wicked to accept God's commandments, even in his Promised Land. In the dispensation known as the Christian Dark Ages by biblical scholars, the final prophet to write in the ancient "gold tablets," the prophet Mormon, was charged to bury them at the end of his life.

The burial place is alleged to have been near what is now Palmira in upstate New York, where they lay in wait for a specific time to be revealed to a new prophet who would restore the church to earth.

That restoration is among the most treasured narratives in Mormonism, for a fourteen-year-old boy by the name of Joseph Smith would one day be visited by Jesus Christ and God and shown the burial place of these tablets. He then translated the plates through the help of the urim and thummum and emerged with the foundational text for the church: *The Book of Mormon*. Smith became the first prophet of the modern day church and began an aggressive proselytizing effort. The church grew quickly. The modern day Church of Jesus Christ of Latter Day Saints was thus restored to the Promised Land—promised to the chosen people and to a chosen land, and that promise maintains a strict loyalty to Mormon exceptionalism.

In this way, Mormons are pre-destined to fulfill divine work throughout the world, especially if that work furthers the democratization and freeing of other nations so that proselytizing can begin in those countries. Intervention in world affairs is thus viewed in God's time, which embraces the eventual end times narrative playing out as in a book of scripture. Stephen O'Leary notes that, "American intervention might trigger the war among the ten kingdoms that brings historical time to a screeching halt, thus hastening the advent of rapture.... In addition to its usefulness as a rationalization of otherwise inexplicable events, the apocalyptic narrative also prescribes right action" (25). Indeed within this idea of intervening in God's time to hasten His eternal agenda

is the notion of the “right” or “opportune” moments that suggest the ethical dimensions of acting as an agent on behalf of God’s plan.

Growing up in this culture as I did perhaps decreases the extent to which the apocalyptic narrative might seem odd or perhaps even surprising as it might to outsiders. I appreciate your self-consciousness here. It was as commonplace as any other thing we learned in church –swearing is bad, stealing is bad, someday soon the earth would be destroyed by nuclear holocaust. Simple. As a boy, even at the tender age of 8, I knew well the doctrine of the pending apocalypse. In the end times, which we all were living in (and *that* part was always stressed), an anti-Christ would rise to power and the forces of evil would converge together to bring down the righteous in what one of my Sunday school teachers loved to call World War III, as if he were reviewing a newly released video game. The United States and Israel would band together and fight the onslaught of every other country until Christ returned to demolish what little had not already been nuked by the free-flying atomic and hydrogen bombs. If you are unlucky enough to escape being incinerated by the heat of an atomic bomb, you will be lifted rapturously from the earth prior to the delivery of an utterly destructive blow—where all other living things would be destroyed instantly by fire.

These facts, to my mind, were common knowledge and part of the everyday consciousness of the cultural practices that, even then, seemed to me pre-occupied with the pending end of the world as we knew it. Such pre-occupation bred active participation in national and international political affairs, and so my brothers and I always knew, as children of the 1980s and because our church leaders told us so, that

Russia would give rise to the anti-Christ. And so my brothers and I spent many afternoons reenacting the 1980s Cold War-inspired film *Red Dawn*, killing Russians with our plastic M-16s and grenades, and waiting, finally, for the sonic boom that we imagined would usher the coming of Christ.

As a young church in America, however, Mormonism as a whole rejected political participation for the first 100 plus years of its existence, seeing the government as its ideological, and at times militaristic, adversary. They favored their closed society where information could be controlled and disseminated and where they could practice their cult-like beliefs and practices in relative harmony. The early church endured strong persecution as a result of their cultish beliefs and were driven from several settlements by force. That history is not particularly relevant for my purposes except to suggest that the string of bloody feuds left the Saints looking for a second Promised Land, which, along with many other hopes and dreams, led them West.

The trek west led them to a landscape which appeared, at first glance, like the Promised Land that their ancient prophet, Lehi, had fled near Jerusalem and the Dead Sea in search of America. The Great Salt Lake and the basin and range topography of the Salt Lake Valley must have inspired the prophet Brigham Young to declare it as the place to settle. As it is known now, the Great Basin in Utah was at that time the most unexplored territory in all of the West. Its vast expanse extends from the Salt Lake to Reno, Nevada, to the West, Pocatello, Idaho, to the North, and Las Vegas, Nevada, to the South—a massive and barren landscape known most famously for its sweeping, flat basins and huge mountain ranges that rip through the desert floor. It is inspiring

landscape for some and an uninspiring and utterly lifeless to others. But for Mormons, it was the place, Zion—a new fulfillment to the old promise made thousands of years prior in a time and place that was God’s restoration of His church for His chosen people. Mormons had found a place to finally practice their religion in peace in the landscape set aside for that purpose.

Still, trouble began to brew in Brigham Young’s promised land which is worth understanding because it is important for understanding the Mormon culture’s later acceptance of the Atomic Energy Commission’s nuclear testing site in Idaho.

The Mountain Meadows Massacre

The writer for Victorian era audiences, Samuel Bowles, writes in *Across the Continent: A Summer’s Journey to the Rocky Mountains, the Mormons, and the Pacific States* about the landscape that opens up once passing over the Wasatch Front as “enter[ing] that Continent within a Continent, with its own miniature salt sea, and its independent chain of mountains, and distinct river courses” (qtd in Francaviglia 133). Indeed, Bowles use of “Continent within a Continent” suggests just how unique the landscape is where thriving new civilization grew in the Great Basin. He went on to discuss features of the landscape and about its inhabitants, “This country was marked wonderfully by nature, and marked now as wonderfully in the history of civilization by its people, their social and religious organization, and their material development.” He goes on from there to discuss the significance of the place to these people:

I do not marvel that they think they are a chosen people; that they have been blessed of God not only in the selection of their homes, ... but also in the great success that has attended their labors, and developed here the most independent and self-sustaining industry that the western half of our Continent witnesses. (qtd in Francaviglia 133)

While many writers observed the industrious new settlement with wonder and praise, it is worth noting that Bowles believed very much in the ideology espoused by Manifest Destiny, calling for Indian “exterminations” if they would not accept the US government’s very reasonable offer to be moved to reservations. To his mind, the Mormon settlement was part of another promise of the land to the God-inspired and growing nation. Bowles also captures and celebrates the qualities of the people, the place, and the economy in the success of this independent and self-sustaining community that also gave rise to another impulse – to protect it from the outside. Of course the Mormons, who had fled earlier settlements in the Midwest, grew more and more brazen to threats from outside their community, but there was also a new allegiance to the sacredness of the place itself, which together meant that fleeing into the wilderness once again would never be an option.

By 1857, the year of the Mountain Meadows Massacre, the Mormons had claimed an empire they called “Deseret.” Francaviglia notes that, “The Mormon’s movement into it [The Great Basin] qualifies as nothing less than one of the world’s great religious diasporas” (133). In 1851, they had gone as far west to settle in Genoa, Nevada, at the base of the Sierra Nevada range, and then in another few years to what

is now Las Vegas, Nevada, to the south, and even made it past the Mojave Desert to San Bernardino, California, in search of a sea port. At the same time, the Salt Lake valley had been transformed to resemble what Bowles called, “a fairy tale land” with its trees and gardens and flowers.

Perhaps because of this “fairy-tale” place the Mormons had built, and the lingering antipathy they held for Gentiles who had persecuted them and killed their first prophet, Joseph Smith, it might have been easy to predict a tragic event. In hindsight, it seems like the logical next step. In September 1857, a group of 150 Missourians and Arkansans made it to the southeastern edge of the Great Basin – far from the gardens and flowers in Salt Lake – on their way to California. But once the wagon train made it safely into the boundaries of Deseret, they were ambushed and slaughtered by Mormons.

Local Native American tribes received the initial blame for the massacre, but as the slaughter gained national attention, Native involvement seemed dubious at best. The most credible accounts suggest that the wagon train headed for California had been told by the Mormons in the area that they would offer them safe passage through their settlement, including safety from the Natives. However, it is widely accepted that the Mormons orchestrated the massacre after hearing anti-Mormon comments by some of the Missourians. That Natives taking the blame was perhaps part of the plan, as Mormons considered them to be savage, Godless, and direct descendants of the wicked and warring Lamanites in *The Book of Mormon*, who were marked by dark skin and

engaged in many wars with the white and faithful Nephites – descendants of the ancient prophet Lehi.

Francaviglia writes of the massacre, “On many occasions, Christians have taken up the sword against each other ... and when the followers of different religions consider their differences irreconcilable, as with the modern Jews and Palestinians, the results are almost invariably tragic—especially when those religions claim well-defined geographic space and wield considerable political power” (137). That Mormons had staked out Deseret as its holy land and located Zion centrally within its borders lends credibility to Francaviglia’s assertions here. In no other time in their history (albeit a relatively short one) had Mormons determined to take justice into their own hands in such a grand and horrific statement to the world, killing an estimated 150 men, women, and children. Such brutality contrasts Bowles’ peaceful and tranquil “fairy-tale land” of Zion to the north. Indeed, Mormon leadership in that fair city quickly distanced the church from the actions of its Deseret settlers and called for justice. In the end, however, only one man would pay for the mass killing, almost as a token. John D. Lee, a Saint who had been driven from the Midwest and made the trek west to the promised land, was hanged in 1877 for the murders.

The historian Juanita Brooks adds a contemporary analysis on the place of the Mountain Meadows Massacre: “It is difficult to visualize a massacre in this setting ... with its peace and absolute quiet.” She goes on to imbue the details of the mass killing in the descriptions of the landscape: “The lush meadow described with such enthusiasm by early travelers gone, the stirrup-high grass replaces by twisting wash.... This land,

poisoned and contaminated by the blood that was spilled here, has been cursed by God, old-timers say; he washed it clean and decreed that nothing of value should ever grow upon it" (qtd. in Francaviglia 136).

Such an interpretation contrasts, of course, with the flourishing empire the Mormons built and the relative peace the Saints had managed to that point in their troubled history. On one hand it is easy to see the massacre as an isolated event by a group of paranoid men who interpreted the wagon train's passage through Deseret as an immediate threat to their security, and clearly evidence points to such an interpretation. On the other hand one can interpret the events along a continuum of time and place and a destined meeting where Mormons would be tested once again by God, as certainly John D. Lee and company had.

Viewed this way, we can see that Lee and company must have believed that at *this* time they would act because it was the *right* time, a time of crisis, and some opportunity hanged in the balance of action or inaction. Of course there is an ethics built into this interpretation of timing, for rightness is relative and continually being updated based on a host of factors in any given context, especially in a time of crisis. Likewise, the perceived opportunity is also a qualitative judgment. An ethical interpretation of this massacre might be found, however, within the Mormon scripture itself. The Saints had shown strong ethics when based on their holy scripture –*The Book of Mormon*; so strong, in fact, that it could have and I believe ultimately did lead to an ethically motivated attack on the unsuspecting outsiders. I trace the scriptural account

that I believe led to such an ethic here, assuming most readers have only passing (if any) knowledge of what the Mormon scripture contains.

The first prophet to write in the *Book of Mormon* is a young man by the name of Nephi. Nephi is the son of Lehi (who you will recall received revelation from God that Jerusalem had been slated for destruction and thus ordered his family to flee). In the first book, First Nephi, Lehi and his family make preparations for the trip to the Promised Land. Amid these preparations (boat building and such), Lehi is visited by one of God's spirits. The spirit instructs him that an ancient record of the teachings, written on plates of brass, of the early prophets must be recovered from an evil man named Laban who lived in the fated city of Jerusalem. The job is handed down to his son, Nephi, who accepts it by uttering among the most celebrated and often quoted lines in all of Mormon scripture: "And it came to pass that I, Nephi, said unto my father: I will go and do the things which the Lord hath commanded, for I know that the Lord giveth no commandments unto the children of men, save he shall prepare a way for them that they may accomplish the thing which he commandeth them" (1 Nephi 3:7). The passage is intriguing and relevant to the Mountain Meadows Massacre because it places the means to whatever end as a contextually interpretive one – that which furthers a commandment of God finds an immediate ethical course of action.

I recall many Sundays as a boy sort of half-singing the Mormon hymn that was inspired by Nephi's response to his father's revelation: *I will go, I will do the things the Lord commands. I know the Lord will find a way; he wants me to obey ...* Even now those lyrics, the ancient woman at the piano hammering out the tune, the adults belting

out the instructive message, arrive to my consciousness as clear and precise as though I am sitting there in a pew hearing the words, yes, but mostly listening to my stomach growling. From my experience, Nephi's wisdom permeates all of Mormon culture, directly and indirectly, across past, present, and future, for it justifies an ethic based on the righteousness (and commandment) of an end goal without specific regard to the means, so long as the one carrying out the means is guided by the spirit.

There is a twist, you see, to Nephi obtaining the brass plates from Laban, for the wicked Laban does not want to give the plates to Nephi, even after Nephi and his brothers brought in trade all of their once abandoned riches (gold, silver, and other "precious things") his family had left in Jerusalem when they fled the wicked city. Instead, Laban seizes their property and sends his servants to kill Nephi and his brothers. They do escape, however, finding shelter in a cave far from Jerusalem and Laban's murderous servants. While holed-up in the cave, Nephi's brothers, Laman and Lemuel, turn on Nephi and their father's revelation to retrieve Laban's plates. Ever the stalwart, Nephi responds to his brothers:

Now behold ye know that this is true; and ye know that an angel hath spoken unto you; therefore can ye doubt? Let us go up; the Lord is able to deliver us, even as our fathers, and to destroy Laban, even as the Egyptians. (1 Nephi 4:3)

Reluctantly, and with much "murmuring," the brothers do concede to accompany Nephi again to Jerusalem to confront Laban. Once they reach city walls, however, Nephi instructs his brothers to hide while he carried out the Lord's bidding, saying "I was led by the spirit, not knowing beforehand the things which I should do" (1 Nephi 4:6).

Nephi, thus guided, finds Laban, “drunken from wine” and passed out. I will quote from the next passages here to preserve the language and the full, uninterrupted account:

I beheld his sword, and I drew it forth from the sheath thereof.... And it came to pass that I was constrained by the Spirit that I should kill Laban; but I said in my heart: Never at any time have I shed the blood of man. And I shrunk and would that I might not slay him.

And the Spirit said unto me again: Behold the Lord hath delivered him into they hands. Yea, and I also knew that he had sought to take away mine own life; yea, and he would not hearken unto the commandments of the Lord; and he had also taken away our property.

And it came to pass that the Spirit said unto me again: Slay him, for the Lord hath delivered him into thy hands. Behold the Lord slayeth the wicked to bring forth the righteous purposes. It is better that one man perish than that a nation should dwindle and perish in unbelief.

And now, when I, Nephi, had heard these words, I remembered the words of the Lord which he spake unto me in the wilderness, saying that: Inasmuch as thou shall keep my commandments, they seed shall prosper in the land of promise.... And again I knew that the Lord had delivered Laban into my hands for this cause

Therefore I did obey the voice of the Spirit, and took Laban by the head by the hair of the head, and I smote off his head with his own sword” (1 Nephi 4:9-18).

This story happens eight pages into the *Book of Mormon*, and so it is among the most often told and read in Sunday school. And even all of these years later, as I write this, I remember the gruesome detail—and Nephi’s vengeful turn. There is even a tone of sadistic irony in the added detail that he killed him with his own sword. Even as a young boy I wondered about that line.

While I think the passages from Nephi’s account speak for themselves, I will point out why Lee and his fellow Mormon crusaders were no doubt inspired by the conventional wisdom passed down through Nephi’s inspired murder. First, Nephi held the idea that his actions were inspired by God through his Spirit. Therefore his agency is given over to this unseen force—he is but a puppet even as he struggles to do what he is commanded. His reluctance to obey is brief and the rationalization shows a quick and vengeful turn: “I also knew that he had sought to take away mine own life; yea, and he would not hearken unto the commandments of the Lord; and he had also taken away our property.” Taken separately, the Mormons could rationalize their actions in the same specific ways: Many Mormons had been murdered, including their beloved prophet and his brother, Joseph and Hyrum Smith. Although it may be just the spinning of a tale over time, one source suggests that “in the rising tension one emigrant man reportedly claimed he had a gun that killed Joseph Smith” (Ensign). Based on Nephi’s account, it is clear that the Lord preserves those who accept His gospel and that those who do not impede its progress. The Mormons had been driven from every settlement they had established—their property seized or stolen. Finally, there is the line about

Nephi's seed prospering in the land of promise. Clearly, with the success of building Zion and the greater empire of Deseret, Mormons were determined to stay.

Given the culmination of these temporal and spiritual conflicts, I see the Mountain Meadows Massacre as almost inevitable to happen—perhaps not there and with these particular people—but somewhere and with similar people. It took two days for communication to pass back and forth between Salt Lake City and the nearest large settlement in Cedar City. The massacre happened at a point in time where an ethical rationalization to act had manifested itself to the Mormon group. This ethic is expressed in a Mormon monthly publication, *The Ensign*, in analyzing Nephi's killing of Laban:

Nephi knew he was required to confide in God, to exercise faith, and to act so that he could receive help, step by step. He did not murmur nor ask for a full explanation. But, observe particularly, he did not wait passively for help. He acted! By following spiritual law, he was inspired and given power to act. (qtd in Leavitt and Christensen 18)

We see a clear connection between exercising faith to receive help and the interpretive qualities of being guided by spiritual law, which is perhaps far more powerful in the lives of those who truly believe they are acting as agents of God, guided not by human whim and fallibility, but by divine providence.

Lee and his mob of Mormons indeed did not wait passively – they acted! The opportunity they perceived in massacring the innocent (and unarmed) emigrants is of course conjecture all these years later, but evidence points to the vengefulness of the

action itself—murdering defenseless, unsuspecting, and innocent people at close range. It resonates with Nephi's dark observation that he had beheaded his enemy with his own sword and speaks to the guiding ethic that perhaps the Mormons had interpreted as the emigrant wagon company being delivered into their hands at that time and at that place. The spiritual law and its guiding ethic seems to have motivated the action. Had Lee and other Mormon leaders waited just one more day, they would have received word from Salt Lake City. For on the following day after the massacre, Brigham Young writes to Lee and Isaac Haight:

In regard to emigration trains passing through our settlements, we must not interfere with them until they are first notified to keep away. You must not meddle with them. The Indians we expect will do as they please but you should try and preserve good feelings with them. There are no other trains going south that I know of[.] [I]f those who are there will leave let them go in peace. While we should be on the alert, on hand and always ready we should also possess ourselves in patience, preserving ourselves and property ever remembering that God rules. (See Brigham Young to Isaac C. Haight, Sept. 10, 1857, Letterpress Copybook 3:827–28, Brigham Young Office Files, Church Archives)

Such rational and logical advice is devoid of the immediate context, however. One might imagine the letter Nephi's father would have likely written (absent of the context) in response to whether or not his son should chop Laban's head off with his own sword. In the end the massacre would bring only shame and further mystery and even fear to a

people who were already viewed as a strange and secretive cult, who observed odd and archaic traditions in the arid and unforgiving Great Basin landscape.

The MX Missile Crisis

The 1857 Mormon settlers could have perhaps predicted the end times narratives that would give shape to the crisis, but the technological feat of the proposed MX missile defense system would have defied even the most horrible renderings of Armageddon the prophets had imagined in their sacred scriptures. For the saints, the Great Basin and Deseret was the designated place for the will of God to unfold. One can see a shared imagination for the West in general as it has always served men as a receptacle for their dreams, both spiritual and pagan. These connections with the land are best exemplified by the West's first people – Native Americans. The Shoshone tribe of the Great Basin in particular held a deep imaginatively sacred connection to the landscape that sustained them despite its harsh climate and aridity. Mormon settlers envisioned, in contrast, a landscape that they would alter to fit their needs – it would bloom like the Garden of Eden. Despite these contrary connections to the land, they both share an imagination for this landscape with spiritual as well as temporal roots. For both groups, the depth of the human and religious connection to the landscape foregrounded most social, political, and economic decisions—albeit in vastly different ways.

On September 7, 1979, President Jimmy Carter first unveiled to the public a proposed missile defense system that would place 200 MX missiles across 47 Great Basin valleys in eastern Nevada and western Utah. The announcement, as Mathew

Glass suggests, “acknowledged the completion of a lengthy imaginative process” (256). From a technological and scientific perspective, the imaginative process is clearly at work here, but from the pragmatic standpoint of where to locate these massive missiles, President Carter’s proposed location was never really a question. The location of the MX missiles in the wide-open spaces of the American west was predictable, if anything, because the vacant inland west (as it must have appeared to the Eastern imagination) had already been deemed the nuclear wasteland, playground, and waste repository since the end of WW II. It was the developing ground for its separate atomic military installations in Los Alamos, Hanford, Rocky Flats, the Nevada Test Site, and, of course, the Nuclear Reactor Testing Station in Idaho. The place to locate the defense system, so it seemed, was a no brainer.

To Carter’s credit at that point most local communities and cities had competed over the location of these nuclear labs, launching extravagant campaigns to seduce AEC administrators to choose their city as the place to build and experiment and blow things up. However, the idea of locating the MX defense system on the sacred lands of Mormons and Shoshones brought with it new resistance from unexpected voices.

The MX missile was at the fore of a civil long-range missile defense system and had been researched and developed over a period of two decades—during the height of the Cold War in the late 60s and 70s. The MX, however, created logistical problems as a viable homeland defense system simply because of its immense size. Most of the size went toward propelling between ten and twelve warheads, with the destructive power of 300-500 kilotons, but the MX itself was seventy feet long and weighed in at 192,000

pounds. The logistics of transporting and housing 200 of these missiles in the Great Basin was among the most ambitious (and destructive) domestic militarization projects ever seriously considered to be built on American soil. Such considerations, however, were not framed through the same lens as they are today, and so the MX project seemed like a slam dunk for all involved, especially when considering the economic windfall that the western defense and nuclear projects had brought to the rural west.

After all, the construction jobs alone, planned to last a full decade, had been an enticing feature of every nuclear construction project to that point, and this one would surpass any in size and scope. The economic windfall would be great. The MX required the construction of 200 shelters, clusters of maintenance facilities, two operational bases, a rail line, and an estimated 10,000 miles of new roadway that would connect the MX shelters and also withstand the awesome weight of the missile, launcher, and transporters at 1,600,000 pounds. "According to Air Force publicity sheets, the transporter, 201 feet long, would become the largest rubber-tired vehicle in the world" (Glass 257).

Carter attempted to sell the project by down-playing the impact it would have on the environment, which the Air Force public relations team claimed would, "have a minimal impact on western public lands." One General said to a group of 250 local citizens in Ely, Nevada, "You can still mine around these missile sites, you can rockhound, you can shoot rabbits.... I'd be happy to retire here, move my family here, Ely would be one of the safest places in the US" (qtd in Glass 258). To go along with this idyllic sense of place, the Air Force's completed sketches of the MX project portrayed

grazing cattle next to the missile shelters, and “buckaroos on horseback contemplating the view across valleys dotted with cattle, sagebrush, and unobtrusive MX shelters” (258). These campaigns had not been required of proposed militarized zones on public lands, but by 1979 public support for the unobstructed and unopposed construction of Cold War inspired weapons labs and other testing facilities. But enthusiasm for a missile defense system so immeasurably massive in scope that seems unimaginable to even the most committed communist hater had waned. There are many reasons for this turning point in the public perception and support of nuclear technology in particular, and a lot of that change is discussed in the SL-1 chapter.

As I developed in the Mountain Meadows Massacre example, clearly the Mormons had acted in part because they felt Zion was threatened by outsiders. That threat brought with it a distinct crisis for which the place was of utmost concern. Fast forward 120 years to 1979 and a lot has changed for the new Mormons in Zion—now a mainstream American religion and one of the wealthiest non-profit organizations in all the land. The Mormon church had learned the lesson well to stay out of social and political affairs and instructed their members to do the same. Their stance on political matters was only present in the sub-text of their moral positions staked out by the living prophets and through established church doctrine.

Yet a new threat to an old problem snaked its way into the Great Basin, into Zion, and into God’s chosen place and people, which shifted the church’s normal political passivity into active resistance. The major conflict reveals an ideology of place between its perceived usefulness during a time of crisis and its ontological symbolic

meaning. Perhaps at no other time during the Cold War era could the Mormon church and a group of Shoshone natives successfully taken on the federal government and the US Air Force. By 1979, however, at least some communities were beginning to see the effects of atomic testing and bomb building and became circumspect of all military operations in the west. Thirty years of unregulated testing, rigorous media propaganda, and the attending sense of paranoia had finally tarnished the venerable image of the west as a nuclear “sponge” and military playground. The image of the cowboy looking fondly out to the MX shelters in the sunset, his cattle grazing nearby, appeared at last to many westerners like the cartoon world it depicted and not the reality it distorted.

New to the MX situation, Environmental Impact Statements had uncovered some of the ramifications of short and long term damage of the longstanding military experimentation, and they predicted what irreparable damage the MX Missile defense system would inflict on the landscape. These statements kept the project tied up in a series of court hearings, which provided the press and the local citizens access to information that had never been vetted in the public discourse in such detailed and accessible ways. One particular detail that spoke to the Air Force’s perception of the Great Basin as a wasteland was Chief of Staff General Lew Allen’s remarks that the Great Basin served as a “nuclear sponge” in the event of a Soviet attack on American soil. Edwin Firmage, Mormon activist and Professor at the University of Utah, wrote in the *Salt Lake Tribune*, “The administration evidently considers Utah and Nevada to be the most expendable part of our nation” (qtd in Glass 259). Indeed a growing tension

between what appeared to be a fundamental perception of these sacred places as an area committed for national sacrifice (as all of the military and experimental labs had proven previously) in order to promote the greater American good.

Firmage's editorial got the attention of the Air Force undersecretary, Antonia Chayes, who replied with a rebuttal to the *Tribune* which colored Firmage's outrage as a misguided interpretation of the MX and the goodwill of the US military:

We are making every effort to consult with the leaders and citizens of the potentially affected areas so as to devise approaches to this vital national undertaking which are compatible with local concerns and values. After all, the Air Force's mission in strategic defense, as in all other areas, is to protect our way of life. (qtd in Glass 259)

Of major interest to my inquiry is Chaye's statement that the strategic defense mission was to protect our way of life, a framing of the place and the MX as not only synonymous in purpose—to destroy in order to protect—but also as a timely ethic of sacrificing the few for the benefit of many. Although Mormons did not see or address the irony in the US Air Force's rhetorical strategy directly (at least from my readings), one can see the same ethic of expedience in the story of Nephi killing Laban with his own sword—the good of the many for the sacrifice of the few, the eternal law. And while this ethic had worked without a hitch for more than 30 years, there was a unique problem in portraying Zion as a national sacrifice region, for it held the opposite image in the minds of a very powerful Mormon culture. The First Presidency of the church had turned a blind eye to the Nevada Test Site, Los Alamos, Hanford, and the Idaho National

Laboratory because their promised land had not been slated as the location of a permanent militarized zone.

An increased effort to popularize the barren landscape of Eastern Nevada and Western Utah as wasteland ensued. The draft of the EIS (environmental impact statement) had given the MX highest national priority status, and so the efforts escalated by issuing photos of the proposed site. Boeing Aerospace (awarded an MX construction contract) made brochures portraying a desert scene devoid of life to anyone unfamiliar with the nuances of the landscape. Key members of the senate and congress were flown over the proposed landscape at high altitudes—one can think of a flight from Reno to Salt Lake City and imagine what the senators and congressmen discovered. Most concurred that the place was uninhabited and worthless. Utah and Nevada representatives were not at all on board with the MX and were disparaged by fellow Congressman Joseph Addabbo (New York) for being “soft on communism and unwilling to shoulder the burden necessary for the good of the nation.... The MX has to go somewhere” (Glass 260). Battle lines were drawn.

The real beauty of the strategy used by Mormons and Shoshones to overcome the heavy handed charges they faced about being friendly to communism (which Mormons certainly were not) and disinterested in the patriotic duties of national security in a time of manufactured crisis is that neither group defended the Great Basin by confronting these charges directly. Instead, they emphasized the cultural value of the place as inseparable from their identities—collectively and individually.

Whether shared or individual, personal experience cannot be judged with great accuracy from a historical perspective, for the truth of personal experience cannot be judged in the same way that empirical proofs can be – they simply *are*. Thus the Mormon framing of Zion as their most sacred and shared identity shows a unique way of arguing in the growing anti-nuclear discourse of the late 1970s and early '80s. The place itself was argued as central to the historic and present identity of Mormons living in the Great Basin and the Shoshone Natives followed suit. Glass argues:

What opponents gained at a rhetorical level through the participation of Mormons and Western Shoshones was the way in which members of these groups spoke about their commitments, their loyalties to the land and people of the region, in short the way their traditions uphold images of the region in which they live. Members of both groups seemed to opponents to speak with a moral voice that was not tempered by subjectivity or masked-self-interest. (261)

The two groups could not argue for the preservation of this landscape by countering the direct claims of the Air Force or the Carter administration, for such arguments would lead them to logically challenge the anti-communism discourse that the Mormons had always publicly supported. They also could not challenge the economic impact from a logical perspective, as the sheer magnitude of the project would have brought an infusion of money unlike any the Great Basin had ever witnessed. Instead they could argue for their sacred places as integral to the construction of their moral and personal identities. If the MX had passed, the Great Basin would resemble the earth after Armageddon—a landscape torn apart, dug up, scraped clean. The place would become

a tomb for nuclear warheads, the overbuilt roads, like tentacles, a constant reminder of the militarization of the newly constructed wasteland. It was a vision of fallout that the opponents could finally imagine and use to gain broad support in their efforts to defeat the MX. Finally, the opponents revealed that the self-inflicted destruction to our sacred places were as devastating and permanent as any real or imagined Russian bombs.

President Ronald Reagan ceased all debates about the MX by shutting it down in 1981. Many speculate that the Mormon First Presidency's public denunciation in the spring of that year had as much to do with the failed MX as anything else:

Our fathers came to this western area to establish a base from which to carry the gospel of peace to the peoples of the earth. It is ironic, and a denial of the very essence of that gospel, that in this same general area there should be constructed a mammoth weapons system potentially capable of destroying much of civilization. (qtd in Glass 265)

Grounding their resistance in the sacredness of the land suggests a profoundly new strategy in the nuclear age. Probably at no other time during the Cold War could such an argument have worked to stop a defense decision deemed necessary for our national security – and it is the only program successfully stopped by public decent. Certainly MX debate was not an opportune time for the government as the nation grew leery (and weary) of nuclear rhetoric after the long and unpopular Vietnam War, the Three Mile Island accident in 1979, and the violent destruction and poisoning of their backyard public lands finally made public.

The Lost River Desert

Whatever else might be said about the Lost River Desert by a government agency seeking to find barren wasteland to abuse, it is foremost home to me. It is the landscape of my youth and the place where I learned to love the earth. It is the place where I came to consciousness about land and its people and the connections we form and the stories we create through inhabiting these places. Earlier I noted Douglas Powell's argument in *Critical Regionalism* that "at any site on the landscape, multiple definitions of place are continually in play and at work, sometimes convivially and sometimes antagonistically" (5). Part of that broader definition of the Lost River Desert comes from a personal place—I am unable to view the seemingly endless broken basalt beds and sage flats in a way that I can see an uninhabitable, inhospitable wasteland. For me, there are few places in the world where I have known such beauty. In the end, however, it is a contested and political terrain as much as anything else. These politics change with time and constitute the dominate definitions of the desert and shape how we *should* understand its importance.

Places only mean what we allow them to mean through the stories we create, maintain, and tell anew—those stories that give us footing and purpose and define patterns of behaving toward the land. While some of those stories are inherently political and shaped vastly by outside influence and worldwide circumstance and conflict, there are more humble stories told by people whose lives are most connected to these places. Certainly the Lost River Desert holds significant meaning for me and my

family. Most of our collective familial memories take us back to that landscape in one way or another, and only to a small degree do any of our memories have to do with nuclear reactors or the Atomic Energy Commission.

Most of my memories of the Lost River Desert take me to vodka-clear freestone waters of the Lost River. The Lost River originates as meltwater atop Idaho's Lost River Range, a spine of crags and peaks extending from the wilderness of central Idaho to the basalt beds of the Lost River Desert. The meltwater tumbles 12,000 feet before joining several creeks and groundwater springs in the valley below. The Little Lost threads a path through alfalfa and potato fields; it meanders behind a church near Arco; it pushes by the rusted bones of old Detroit, cars sunk into its bank to prevent erosion; it gathers, as it passes, what it touches and carries what it gathers to the Lost River Desert, where it winds a broken path through the basalt beds and sage until it crosses the western border of the Idaho National Laboratory Department, the most recent permutation of the AEC's Nuclear Reactor Testing Station. The river then disappears, as if swallowed by the desert, lost.

Our father taught my brother and me how to catch wild trout on the Little Lost. Those summer days we would head out from our little place on the edge of the desert, on Snake River Plain, making our way across the Lost River Desert and the Nuclear Testing grounds to the heavily willowed banks of the Little Lost. We would spend the day catching tiny trout and later organize our catch according to size and quantity. My father would often break into story about fishing the Little Lost with his father when it became clear that he had both caught more and bigger trout.

My father knew no other life than the one lived in this tiny world, a world so entirely cut off from the rest of the country that he barely had reason to believe in anything that happened outside of this microcosm. This microcosm included the land amassed by the Atomic Energy Commission, roughly the size of Rhode Island, and the men who worked there. Whatever else he knew about the testing site—his perhaps vague understandings of nuclear research reported in the local papers—was less important than the prosperity the site brought to this impoverished little world. What was visible to him, what he could see and touch, surpassed any other logic, and what he could see and touch reassured his safe place in this world, his ability to feed his growing family, his faith in hard work.

On a recent trip home, as I prepared to write a portion of my research, I ask my mother if she would like to take a drive out to Atomic City, just a few miles from the nuclear site.

“You know I’ve lived here sixty years and never been to the town itself,” she says.

“It’s not much, but it’s worth the trip,” I say. I had been feeling particularly disconnected from the desert, as I struggled to make connections with my younger self and with the landscape of my youth.

When we roll into Atomic City, I notice a new BLM building, fenced-off with razor wire looped along the top, right next to the old Twin Buttes Bar, now a refuge only to stray cats. An old brown Ford drives by as we turn onto Big Butte Road. The men inside

watch us pass; they are bearded, lean, and no doubt skillful handlers of the four rifles hanging in the back window.

I stop the truck when the road turns back to gravel, a hundred feet out of town, and park on the side of the road. We get out and shade our eyes and peer out into the desert. My mother leans over the side of the truck, draping her arms into the bed. She holds her gaze on the Twin Buttes to the north.

“They never seem so big when you get out this close,” she says. I turn and dangle my arms into the bed and watch with her. It occurs to me how little I know about my mother’s relationship to the nuclear test site. Having lived all of her sixty-five years on the edge of it, I wonder what she sees when she looks out our west-facing window every day.

“Do you know much about what went on out here, back then?” She turns to look at me, knowing that I have studied it thoroughly.

“Not really, back then nobody knew much of anything. I still don’t. My brother has worked out there for thirty years and his wife doesn’t know if he sweeps floors or builds bombs,” she says. Of course her response does not surprise me.

“What do you know about out here?”

Before I have time to think of a more gentle way to breach the subject, I blurt out

“I think radiation gave dad the cancer,” I said.

She brushes her still blonde hair away from her face and takes off her glasses and wipes her eyes. “That sounds like conspiracy theory, son,” she says, looking away. “We better get home.”

My mother turns and looks at me with tears forming. “What good does it do to know—nothing. It’s home. That’s all I know about this place; it’s home, and that’s enough for me.” With this, she gets in the truck and closes the door. For a moment, I want such a beautiful explanation to be enough for me, too. But it isn’t. It will never be.

A Prelude to The SL-1: The DEW Line and Sputnik

It seems probable to me that God in the beginning formed matter in solid, massy, hard, impenetrable, movable particles...so very hard as never to wear or break in pieces, no ordinary power being able to divide what God himself made one in the first creation.

—Sir Isaac Newton

Of course Newton was wrong. Had the early nuclear scientists observed his metaphysical reverence for whole matter, they may have never discovered that uranium atoms could be made to fission.

The psychologist Milton Schwebel took on the daunting task of understanding the presence of nuclear realities in the lives of those who grew up in this cultural environment in his study, "The Construction of Reality in the Nuclear Age." He begins by observing something of a truism: "Among the changes triggered by the atomic bomb at Hiroshima were those in the human mind" (521). Among these changes are those perceived ideological necessities used to build the ethical arms of atomic research. It is therefore no stretch to suggest that a new technological ethic was adopted both as a tool to persuade and a sincere attempt to conceptualize this immense power.

The nuclear age brought with it a new mode of thinking about time, continuity, and the frailty of the earth. At no other time had humans been capable of destroying the earth—that had always been a power reserved for God. As I discussed previously,

this awesome power found understanding through old religious meta-narratives about Armageddon and the Second Coming of the Lord. It also brought honor and duty as the ethic required to protect its secrets as the country amassed its arsenal and sought peaceful applications of the research. Indeed, the nuclear age was marked at first by a sense of good.

A technological expediency accompanied the divine explanation of the nuclear age and helped “sell” the inherent necessity of this technology as another kind of savior to mankind, and there were many scientists willing to make that argument.

We have to go back in time briefly to the University of California, Berkeley, to understand the scientific fervor that accompanied the discovery of the new element plutonium. The Italian physicist, Enrico Fermi, made the earlier discovery that uranium atoms could be made to fission. By 1941, chemist, Glenn Seaborg, performed an experiment that has not been repeated in the history of science by creating a new element. The new element, plutonium, was fissionable and thus very powerful. The importance of this discovery made atomic fission a viable source for energy. To that point, only the extremely rare form of uranium, U-235, was fissionable. Plutonium, on the other hand, is made from U-238, which is an abundant resource. Seaborg understood the implications of his research and became the greatest advocate for its potential uses. It is here where the arguments for a world energy supply run completely by plutonium began. The historian Richard Hewlitt, author of the official history of the AEC, knew Seaborg during this time:

Seaborg was the granddaddy of plutonium, and it was always extremely important to him that he discovered a new element that would be the salvation of mankind.... Plutonium to him was very sacred. It made him a hero in the world of science. He saw the whole world revolving around this technology, and here was in the center of it. (qtd. in Ford 23)

The well-being of our future civilization hung in the balance quite literally for Seaborg. He knew of course the military's interest in the technology. According to Daniel Ford in *Cult of the Atom*, he had been one of the Manhattan Project scientists to sign a secret report to the Secretary of War, "urging that the power of the atomic bomb be demonstrated to the Japanese by dropping it on a barren island rather than on a city" (23). Seaborg perhaps didn't anticipate just how profoundly his discovery would change the nature of war between nations because he focused nearly all of his attention on selling a vision of the world powered by his discovery—not destroyed by it.

According to his prospectus on its potential uses, "nuclear energy was a magician's potion that could free industrial society permanently from all practical bounds. Millions of homes could be heated and lighted by a single large reactor ... the deserts could be made to bloom, sea water could be made potable, mountains could be moved, rivers diverted—all as a result, he prophesied, of planetary engineering made possible by the miraculous new element" (Ford 23). Indeed, Seaborg was fond of overstating the significance of what he perceived as giant electric stations, "each nuclear plant surrounded by its own little Eden." Based on Seaborg's predictions, nuclear scientists became celebrities, even demagogues, of this new technology. "They

were looked upon as the high priests of a state religion that promised social progress by means of made-to-order technological advances” (24). And so we see a familiar ethical thread woven into the broader fabric of atomic research, but here with an interesting twist. The often-polarized worlds of science and religion had been bridged by this new technology—a technology given to scientists by God. Thus scientists became like high priests of the atom.

But for most of the scientists themselves, the technology took on a more secular metaphysical importance. Allen Weinberg is credited as the theoretical physicist who first designed and later patented a water-cooled nuclear reactor. In an interview he describes having read a book by the physicist Charles Darwin (the grand-nephew of the more famous biologist), titled *The Next Million Years*. One essential argument of the book is that man must develop an inexhaustible energy source other than the sun or the earth would become basically uninhabitable. Weinberg continues, “you had in the uranium in the rocks, in principle, an inexhaustible energy source—enough to keep you going for hundreds of millions of years. I got very, very excited about that, because here was an embodiment of a way to save mankind. I guess I acquired a little bit of the same spirit as the Ayatollah” (Ford 25). Weinberg’s design would be very similar to the one adopted by the Army and its experimental reactor, the SL-1.

These arguments, led by the “Granddaddy of Plutonium” and official salesman for the atom, Glenn Seaborg, helped create what Ford calls the most powerful federal agency ever created—the Atomic Energy Commission. To sum up the extent of his ambitions, by the end of the century Seaborg had dreams of 1,000 nuclear plants

operating peacefully in the US. Guided by these ethics, Seaborg held vast authority over the nuclear program during the years the atomic cities were constructed, and especially over the Nuclear Reactor Testing in Idaho. Of particular importance for my purposes is to emphasize the earlier rhetorical strategies Seaborg used to describe this technology. His greatest concern in his zealous approach is instructive here, “My only fear is that I may be underestimating the possibilities” (Ford 24). Against this rhetorical backdrop, the AEC granted Seaborg and three other commissioners nearly limitless power when it came to nuclear research.

This commission created all rules and regulations, including safety regulations that governed the nuclear power program. The commission decided locations, designs, and safety mechanisms for proposed reactors. Ford describes Seaborg’s involvement by suggesting, “that [he] authorized and nominally supervised the most ambitious construction program in the United States since the building of the railroads in the nineteenth century” (Ford 26). While the commission did not necessarily set the regulations for the military’s testing program, it seems likely that nothing the Army was doing in Idaho would have caused much concern. The AEC, by design, was charged with first championing the cause of “atoms for peace,” but, at the same time, paradoxically charged to be the rational steward for responsible nuclear safety. Seaborg’s enthusiasm and the practical safety concerns raised by the same agency was a design flaw in itself—one that foreshadowed the construction and subsequent deadly explosion of the SL-1.

Seaborg and the other “High Priests of science,” as Ford calls them, were playing a new game, and the stakes could not have been higher for them and for the world in

their eyes. And while they thought they were making up their own rules to the game as they went along, it turns out instead that they were mapping out the demise of the whole undertaking.

The Distant Early Warning Line

Following the creation of the Atomic Energy Commission in 1946, the same year my father was born, a wave of “atoms for peace” rhetoric washed over the country. The Army was falling behind in the nuclear power race, with the Navy working on the nuclear submarine and the Air Force on a nuclear aircraft, and so in 1952 the Army began a nuclear power program to subsidize its nuclear weapons manufacturing. By 1954, President Eisenhower announced an ambitious engineering project that would rival anything carried out in the twentieth century, including the Manhattan Project, and that announcement launched a sequence of events that led to Idaho’s Lost River Desert.

The Distant Early Warning Line (DEW Line) was an unfathomably large chain of radar stations 200 miles above the Arctic Circle. It was designed as the first line of defense against Soviet bombers, providing an estimated three-hour warning before an aircraft carrying weapons could reach the U.S. The size and scope of the DEW Line speaks volumes about technological expedience of the Cold War, which rendered defense systems obsolete almost immediately after completion. In total there were fifty radar stations completed, constructed in three years and in the most severe weather conditions. According to many historians and Western Electric’s (the civilian contractor)

own brochure touting the impressive feat, it required the largest amount of air-lifted supplies ever – over 500,000 tons worth—enough gravel to build two great pyramids, twelve acres of bedsheets, three miles of window shades (Tucker 98).

Of particular importance for the Arctic Circle's DEW Line and eventual relevance to Idaho is yet another statistic—the sheer amount of diesel fuel required to power the 50 radar stations. The electrical needs of the stations required as much electricity as the average US city with a population of around 100,000. In the three years spent constructing the radar bases, Western Electric transported seventy five million tons of diesel fuel to power the generators. The supply lines for the fuel were not reliable, and in a wartime situation the radar capability could easily shut down with even minor disruptions in fuel transportation, which proved difficult enough even in peace time and with an unlimited budget and ready manpower. Ironically, just a year after one of the most impressive engineering feats the US had ever undertaken and completed, it was rendered obsolete because of the massive amounts of fuel it required and a nearly impossible task of keeping it stocked in the long term. In this context, the need for portable nuclear energy led a trail of nuclear enthusiasm to the Nuclear Reactor Testing Station in Idaho.

The basic premise behind these small, semi-portable reactors was simple enough. One reactor could power a base and would operate for years without the need for additional fuel. And with the singular vision of a feared Army Colonel named Lampert, who declared, “the success of their project might mean the survival of the nation, (98) the project earned crisis status in a time when the Soviet threat grew each

day. The logistical and design features of these new reactors are interesting in and of themselves, but all the more in retrospect, given the sheer ambition it must have taken to accomplish from an engineering standpoint alone, and setting aside the practical work of transporting and assembling the arctic nuclear reactors.

In the end, the DEW Line, serving as a 3,000-mile virtual fence, costing a billion to construct, and killing twenty men in the process, was maximally effective for about nine weeks. One can hardly conceive of such a mammoth undertaking at any other time, where a technological ethic drove decisions to exclusion, and these decisions, despite the monumental efforts, were psychological victories as much as technological ones. In what must have seemed at the time a cruel twist of fate to the American military, on October 4, 1957, the Soviets launched Sputnik. Because the Soviets had built a rocket with the capability of launching a satellite into space, the Pentagon assumed the same technology could be used to launch a nuclear warhead from Russian soil to the US. General Earl E. Partridge, the commander of the North American Air Defense Command, told a reporter after learning about the Soviet technological feat, “the continent stands today almost as naked as it did in 1946, for I have no radar to detect missiles and no defense against them” (Tucker 104). The Soviet technology dealt a blow to American exceptionalist thinking, just as the Soviet demonstration of atomic weapons capability had. If anything, however, the crisis surged toward even greater urgency and thus technological expedience. The Army planned construction of an atomic snow train that would carry nuclear reactors, and possibly atomic weapons, to the DEW Line. With that line of thinking, large trucks, and even a nuclear powered tank,

weighing in at fifty tons, became part of the nuclear imagination spurred by the Soviet's psychological warfare known as Sputnik, what *Time* magazine described as the "Red Moon over the US" (qtd in Tucker 104). Only in passing did Army generals and nuclear engineers suggest the potential safety hazards that such a fleet of "small" nuclear reactors on wheels present to Americans and the environment.

The urgency to build small, semi-portable reactors to power the DEW line became even more desperate despite the apparent obsolescence of the radar system. The idea was that the DEW Line would serve in some evolving defense capacity and that the energy to power it stood in the way of making any real progress. Not only that, but the atoms for peace propaganda machine had built an ethic around this new technology and instilled a hearty appetite for nuclear power in the American imagination, and to fulfill that divine, prosperous vision the nuclear program had all the enthusiasm, money, and manpower it needed to move full on into reactor building and testing in Idaho. According to now declassified data, over fifty reactors were built between 1957 and 1963 (Stacey 138). But among the first to go up was a little prototype reactor named Stationary Low-Power Reactor One (SL-1), slated for construction in the shadow of the Lost River Desert's most iconic landmark, the Big Southern Butte.

Stationary Low-Power Reactor One

Winters on the high altitude Lost River Desert are long, cold, and extreme by most standards of judgment, but nowhere near as bitterly cold and unforgiving as the sub-

arctic climate where the SL-1 was meant to eventually operate. Still, the desert in Idaho proved similar in other ways that made the location ideal in the minds of nuclear engineers and Army generals. The technical aspects of the SL-1's engineering, including the flaws exposed after the fact, are documented in all of the main texts consulted for this study. The design itself is well understood and described and thus the controversy surrounds why this design was chosen for that particular application and at that time in early nuclear history

From a design perspective, the perceived isolation of the Idaho desert made the landscape particularly attractive for construction and testing. Because of weight restrictions and the logistical aspects required in moving it, the reactor would not have a typical containment building. The size and weight were primary concerns, but the relative low-power of the reactor and the isolation from what the Army deemed as "populated" areas was sufficient enough and mimicked the arctic locations in important ways for testing purposes—which in translation means that the small rural populations were not sufficiently important to worry about, and, if a meltdown happened (accidentally or on purpose), they would have requisite data to understand the radioactive spread and significance of such an event.

First is the deliberate choice to eliminate the containment vessel, something that even in those early days of nuclear pioneering had not been done. The containment vessel, as the name suggests, is designed to contain radiation in the event of a meltdown. Without this shielding, radiation from a melted core would easily pass through the reactor building and become atmospheric radiation—thus creating the

downwind effect. The SL-1's location was remote enough to make the containment vessel an unnecessary luxury that would not be necessary (nor efficiently feasible to construct and transport) in the sub-arctic. The urgency behind the nuclear program, the dream of nuclear powered everything, even tanks, trucks, and trains, etc, was the primary concern, and so the containment vessel would have to go in the name of technological expedience. In the aftermath of the SL-1 explosion the absence of the vessel was among the most closely examined decisions.

Second, the Army's General Lampert also decided to depart from the Navy's pressurized steam reactors, which generated steam in a secondary, non-radioactive loop, considered a much safer design because the steam used to turn the turbines was not radioactive (Tucker 106). The SL-1 design eliminated this secondary loop, which saved a lot of space and material but, again, sidestepped another safety mechanism. The SL-1 was designed as a boiling water reactor, where the reactor core itself serves as the steam generator. The design, "saved considerable on the size and amount of equipment necessary to run the plant, as the entire, elaborate heat-exchanging apparatus was eliminated.... In return, boiling water reactors were in some ways inherently less stable than pressurized reactors" (Tucker 107). The most significant difference between the boiling water design and the pressurized heat exchange loop design is that the boiling water reactor's steam is radioactive and thus more dangerous and volatile on the whole, especially with regard to performing maintenance, a crucial aspect of the SL-1's explosion.

Third, and perhaps most importantly in terms of the cause of the explosion, in the interest of reducing size and materials, and to achieve the most expedient design possible, the SL-1 design called for just five control rods, arranged on top of the reactor core like the “5” pattern on a die. The portions of the control rods that went into the reactor core were made of an element called boron, an element that stopped the fissioning process. When the boron rods were lifted from the core, fissioning began instantly and the reactor would go “critical.” The extent and speed with which these rods were withdrawn determined the reactor’s criticality. The SL-1 reactor design was such that four of the five rods by themselves did not contain enough fuel to activate the reactor to critical level. That simply means that these four rods could be completely removed from the reactor core and would not, according to the known research at the time, send the reactor to critical level. However, unlike other reactor designs, engineers bestowed enormous power on the central control rod. By itself, the central control rod contained enough boron to shut the reactor down altogether if shoved all the way to the bottom of the core and enough boron to blow it up almost instantly if pulled far enough from the bottom of the core. Other reactors at the time built in safety mechanisms which required a combination of rods to be moved up or down to reach critical levels. It was considered a reactor standard of the time—for what appears to be common sense reasons. One engineer later reflected on the design:

to build that much power into a single rod fundamentally reduced the margin for safety inherent in the reactor. Most reactor designs adhered to the “one stuck

rod” criteria, which held that no single out-of-control rod, even if fully withdrawn from the core, could push the reactor to criticality. (Tucker 107)

The Idaho historian Susan Stacy adds something to the logic of the design flaw, one that clearly speaks to the ethics under which the new SL-1 was built:

The vision was to package power plants in three or four pieces, fit them into cargo planes or trucks, and have soldiers assemble them in hours [not months or years]. Easy to operate, a plant would run at least three years on one fuel loading. When the mission ended, the crew could pack it up again and ship it elsewhere. (138)

It is, in retrospect, quite telling of the short-sightedness of the AEC and its portable nuclear program that they actually envisioned setting up these reactors, using them for a time, and then moving them to another location. There is no mention of the radioactive waste generated by the plants—what would they do with it? Nor is there mention of the extremely precarious nature of a nuclear reactor—how would it be disassembled and moved? The gaps in this kind of common sense logic suggest, if we needed more proof, that the AEC worked under an ethic of expedience, one where the situation made any means justifiable so long as there was a moral *rightness* to the ends.

The control rod design flaw that ultimately sent the reactor to criticality was actually something that could have never happened in a core where the rods were lifted mechanically. The SL-1 design required men to manually lift the rods from the core to perform routine maintenance. This design, of course, was intentional. Having the men lift the rods to attach them to a secondary drive mechanism eliminated a bulky and

technical primary drive mechanism. The technical part of this manual labor required the men to lift the 100 pound rods slowly and only to a height between 3 and 8 inches before connecting each to the secondary drive mechanism, which could be operated safely from the control room. Pulling the central control rod either too quickly or higher than 8 inches meant catastrophe, as the reactor would reach critical level instantly and explode—tests had already proven that much as fact.

In the end, the control rod design flaw proved to be SL-1's fate. For the sake of logistical simplicity and expedience, the engineers had nearly blueprinted the demise of the reactor—operated by young, relatively untrained, and low-ranking Army enlisted men. After all, boiling water reactors had been tested in Idaho in 1954. A little breeder reactor named BORAX-1 was built just off Highway 20 between Blackfoot and Arco. It was the first boiling water reactor with much the same design as the SL-1, with no containment vessel. The significance of the BORAX-1 test is that engineers understood the risk of man-operated control rods in these low power reactor designs, but to that point they did not really know what would happen if one of the control rods was suddenly lifted from the core. Ben Plastino, the long time and ultra conservative newspaperman from the Idaho Falls *Post Register* wrote that people traveling Highway 20 may have thought that they saw Yellowstone Park's Old Faithful gushing in the distance, and marveled at the radioactive plume of water and steam reaching 150 feet in the bright and blue summer day of 1954. Some people had been close enough to have witnessed and photographed the "natural" wonder (107). That radioactive geyser proved the present danger of manually lifted control rods in small reactors, but the

compact and simple design was far more enticing than any perceived risk. All things considered, the opportunity outweighed the time it would take to build and test other designs. And for the reactor to remain critical on one fuel cycle for three years, one control rod with immense power was a necessity from an engineering standpoint.

Indeed expedience governed most decisions leading up to and the subsequent construction of the SL-1—and most decisions made by the AEC regarding atomic research and proliferation for that matter. The DEW Line and the SL-1 shed clear light regarding the AEC's virtually limitless power and successful public propaganda in accepting their pursuit of technology.

Place: A Story Happening Many Times

When the rain comes all at once in a heap of blackness, oil-slicking a path across the Lost River Desert's galaxy of open space, thick and furious, I begin a ritual act of movement, a recursive pattern, a generational pull, a tradition I recognize as my father's and grandfather's—marrow in my bones. I always return to rivers.

I am trailing the rain on I-15, heading north toward the South Fork of the Snake River, crossing the plain's broken basalt beds, watching newly washed sage and juniper pass. I drive with the window down, letting the sage-stung air work its way through the cab and into my nostrils, almost sugary, to my lungs. The bulk of the storm is still bullying up the river, probably almost to Swan Valley by now. I drive faster with hope that the first cold rain of fall will trigger a mayfly hatch, and that the cutthroat will move from deep pockets to shallows, to feed on the tiny insects. I have been longing for rain, for river water.

Since my son's birth nine years ago, I have been thinking more about my father, more than twenty years after his death. I have been trying to make connections with myself as a boy, sitting next to him in his little white truck, the sweetness of melted M&M's wafting through the cab, on our way out to fish the Little Lost or Salmon Rivers, or any number of little streams he had learned to fish with his father. I want to remember what it was like to be my father's son.

As I drive I hold my hand out the window and feel the rain slap against my palm, remembering those long ago trips with my father across the plain, his stories, his love for this landscape, his attraction to rivers. Such thoughts, for me, accompany the renewal of rain. Even if only temporary, rain breathes life to the high Idaho desert. A good storm and some warm afternoon sun causes the volcanic soil to become cool and dark, rich with possibility, so musky it smells of potting soil, and where dust once draped the brush and bunchgrass, the desert plants show bright and clean. Yet maybe nothing is more short-lived than the effects of rain on the desert. Memories of my father and me come this way, in brief, precise moments when everything is vivid but unclear.

I turn off the road that parallels the South Fork and slosh through rain puddles, noticing how the runoff washes the river's freestone belly in clouds of silt. The front of the storm has moved through here, on the lower stretches below the canyon, as it makes its way through the dry-farmed benches and bunched-up foothills near Swan Valley. I watch the storm arch above me, curving like a longbow from where I stand to where it falls upstream in dark streaks, plunging on the stone covered wall of Palisades dam.

The cottonwood river bottoms hold still and dark. The osprey that homesteads on top of the old railroad bridge spanning the length of the river, just below my fishing hole, hunkers down. The mayflies, the osprey, the beavers, even the trout await the pale breaks tailing the bulk of the storm, bringing patches of reds and yellows, before they emerge. The complexity of life on the South Fork reduced to the simplicity of waiting—a pastime I have come to know as a rare moment of calm survival.

I lean on the thick trunk of a cottonwood growing on the high bank and watch the South Fork slide under the railroad bridge, remembering my father's instructions on reading water. "The river tells you things," he would say. "It's just that you have to know what it says." He would crouch down as he pointed to a place where the fish were probably laying. And then he would take my fishing rod and cast a line where he had pointed. In the nostalgia of memory, I remember him always reeling in a fish bigger than I ever caught.

My father had an uncanny intuition for knowing what a river says. I suspect that being born and raised mere feet from the Salmon River—hearing its intonation, dissonance, seasonal pitch, a cadence for all his childhood memories—he learned the language of rivers, the meaning of its movement, the grace, the quick runs and gentle riffles, the deep, turbid pools and shallow, clean lines of water flowing over stone. But he also taught me that reading a river is never the same. "Just because that little run had a fish in it last time, doesn't mean he's still there," he told me on one occasion when I was getting skunked. Looking back now I take this as the literal truth that you cannot fish the same river twice, as the Greek philosopher Heraclitus so gracefully observed, because water flows continuously. But for me, and maybe my father too, I've learned that the river tells you different things at different times in your life.

I look down into a fast little run where the trout will eventually begin feeding. I remember the first time I went fishing after my father's death, how even in the utter nothingness of this new perspective, I found a nice boulder with concentric circles rising behind it. It turned out to be a hell of a nice trout. And the time I crawled up the river's

tall bank and propped a shoulder on the cottonwood to watch my brothers cast in the moonlight to boiling trout, anticipating my fiancé's arrival from Montana later that night—this time to stay for keeps. Or the countless evenings I have spent bathed in dusk, the mayflies emerging in clouds, after the rains had come; trout sipping them as they glided by. Of course, I remember the first time I came to the river after my son was born, and when he caught his first fish.

I wrap my fishing vest over my shoulders and pull a mayfly box from its chest pocket and study the assortment of flies: mahogany extended bodies, pale yellow spinners, pink emergers—all tied precisely, and yet still appear clumsy and awkward when compared to the elegance of naturals. I snag a cottonwood limb hanging low and inspect under the leaves for mature mayflies. Two huddle under the protective curl of a large leaf, and I pluck it from the branch, holding it in my lap. The mayflies crawl from the leaf to my hand, stretch their transparent wings straight above their bodies, and take flight for the river. They are early hatchers, mid-morning perhaps, waiting for the rain to quit.

The scientific name for mayflies is *ephemeroptera*, which is derived from Latin and Greek and is translated as a momentary or short lived winged flyer. Mayflies have one of the shortest adult lifespans of any insect, sometimes living only a few hours, but rarely over a day. Mayflies live on the bottom of the river, dwelling under rocks for as long as a year before a shift in water temperature and the right amount of sunlight signals the time to emerge. When the conditions are right, they swim to the surface, break free of their sparkling shucks, raise their cloudy, mottled wings straight and high

and take flight for the nearest tree. Once there they will molt once again, shedding skin from their wings, leaving them shiny and clear. The mayflies then return to the river to mate, lay eggs, and die, a dance so intricate that it takes a year to prepare and less than a day to perform.

I pull on my waders, rig my rod, tie on my boots, and splash through the chocolate rain puddles, watching the storm move through the upper reaches of the South Fork, on its way to Jackson Hole. The upper stretches of the river begin as a tailwater river below Palisades Dam, meandering through Swan Valley before entering the carved-out sections of the canyon, where the river brushes against sheer cliffs and divides a volcanic plateau, before eventually spilling onto the Lost River Desert. It is a working river, to be sure, and in the peak of summer the river swells to capacity and carries the water that will irrigate the crops so important in Southeast Idaho. But by early fall, when the cold rains come and the cottonwoods turn, many of the channels and more shallow runs lay bare and dry. Only the main channels remain, though the water levels still fluctuate by the foot in a day's time.

I walk through the river and hold onto the giant cottonwood that washed-up here, roots and all, when the South Fork flooded a few years ago. It guides my steps along the shallow gravel bar of the river, its smooth skin damp and cold. I watch the osprey move in its nest atop the old railroad bridge. It rises and flies toward the cottonwood bottoms on the opposite side of the river, where a couple of small side channels offer easy white fish hunting. Beavers splash under the logjam dividing the

deep and fast water from the shallow riffle emptying into the dark pool beneath the bridge. The water is still a bit cloudy from the rain; mayflies and trout will wait, as will I. I watch the yellow and red holes in the sky pouring light onto the river, warming my hands and cheeks, drying the cottonwoods and the steel beams of the railroad bridge. I watch as the mayflies begin emerging from the river's bed to the surface, skittering and kicking at the sparkling shuck encasing their wings, drifting smoothly with the river. Some are unable to free wings from their casings; trout snatch others. Soon the mayflies sprinkle the river, holding their wings straight in the air to dry for flight. Some of the mayflies attach to the side of my leg as they pass, crawling up my back and arms. Their slender bodies are mahogany in color, cylindrical and uniform, extending beyond their tall, upright wings as much as an inch, with a trio of thin antennae fanning out two inches from their bodies. Lives just begun yet so close to death.

As they glide by, I notice that they look like tiny sailboats cruising the river. I watch the trout start to make small rings at the end of the riffle, where the female mayflies deposit their eggs in the river. They glide low to the river's surface, diving and dipping their long bodies into the river, laying eggs that will drift with the current and lodge in the crevices of rocks, where the eggs will soon hatch. Each mayfly repeats this process several times and then dies. They glide weightless, nimble, with deft precision, falling to the river, evaporating as ephemerally, it seems, as September snow.

The bigger cutthroats move from the shadows of the deep pool beneath the bridge and into the shallows, where feeding on egg-laying females and dead "spinners"

proves most productive. The river flows clean now, so clear that I can see the orange slashes of the cutthroat as they surface and swallow mayflies.

The smaller trout hold at the head of the riffle. The bigger trout hang near the edge, where it empties into the deep pool. This never changes. I typically have better luck with the smaller trout at first, so I cast the mahogany mayfly in the feeding lane of several small cutthroats. No takers. If the trout here refuse a fly on the first cast, then the fly is either too big or too small, so I tie on a smaller fly and cast again. A trout surfaces and gulps the fly, heading upstream, darting for the cover of a sunken cottonwood tree. It is only about twelve inches long, but the trout are also spirited and well fed, so they do not give up easily.

I pull the little cut away from the sunken log and back into the current where I land it. He is a fine and healthy male cutthroat. I slip the tiny hook from his upper lip and hold him upright, his spotted nose facing the current, and with a flip of his tail he returns to the school, a little behind the other small trout. I know I won't fool him again, at least not this day.

I cast toward the end of the pool, this time hoping for a big one. My fly scoots across the water like a boat in a sea as the spotted nose of a big cut shoots out and swallows the tiny boat. My reel croons as the heavy trout pulls at the line and plunges for the shadows of the deep pool. I simply hold on, knowing you can't control the big ones. The cut torpedoed upstream and then back downstream, working more line from my reel, and then finally holds in the deepest place it finds. I reel in a few turns, weighing him in my mind, and the cut shoots toward me. I pull in yards of slack line,

trying to maintain tension, but it is too late—my line lays limp in the current. Smart Bugger, I think, as I look downriver to see the sun sink into the volcanic floor of the Snake River Plain.

As the river fades to black, I struggle to make out the dappled partridge feathers against the steel blue riffles of the South Fork. I dip my hand in the river, watching it shine my skin the way it burnishes river rock. I scoop water and splash my face with my free hand, keeping my rod tip straight and high with the other hand to maintain the perfect drift of my fly—one last drift. Then I reel in and walk my path out of the river. I hold onto the big cottonwood and curl my hand around the remnants of a limb, like shaking hands with an old friend, then I slip through a small hole in the willows. I scramble up the steep bank, toward the cottonwood, thinking about a summer evening years ago, the first time I brought my son to the river. I had loaded him in a front carrier and walked out to the middle of a shallow little riffle. He laughed and kicked his feet and pointed at the mayflies floating by; he watched the yellow line sail back and forth over our heads. He squinted into that summer day's white light. I caught a trout and worked it in toward us so that he could see it up close. He ran his pudgy little finger across its side and looked up at me, with his cheeks balled above a big grin. I held its nose into the current, and my son splashed at the water covering its spotted back, and then I let the little trout go.

He held his hand in the river, wiggling his fingers in the current, pulling them out when it became too cold, plunging them back in again, splashing both our faces. And we watched, for a time, as the river moved by varnishing our skin, listening to it speak, a

familiar yet vague dialect. I wanted to say to him that the river tells you things and have him understand it, only I wasn't sure what it had said. Even now, as an avid little fisherman, he is perhaps not ready to hear his old man say that the river tells you things if you listen to it.

I prop an elbow on the old Cottonwood and watch the river change moods in the slow, churning eddies, emptying into tall rapids, smoothing out to easy riffles, spilling into a deep pool, and then sliding under the steel bridge. And I try to imagine what my father heard when he listened to the river, what he wanted to tell me about the ritual pull to rivers that coursed like marrow through his bones. I try to imagine how I will tell my own son about the language of rivers before I, too, am gone.

And I am reminded of the poet Kim Stafford who writes, "A place is a story happening many times." These moments written in water, in the fluid recursions of memory, I recognize as a rite among the men in my family—our way of keeping the story going long after we are gone, long after what seems just a brief moment in flight. It is a story that sustains a vision for me of how life and death often converge, and yet seem never to touch.

Maybe my father meant that the language of rivers tells the story of fathers and sons, his story, our story, now my son's. A story told through the return to rivers.

The SL-1: A Deadly Nuclear Explosion

January 3, 1961, was cold by any standards, even for the Lost River Desert in Eastern Idaho. When Lovell Callister heard the siren call at 9:01 PM, it meant he and two of his fellow Health Physicists (HP's) must leave the warmth of their monitoring station and face the wind at twenty below zero. They dressed in radiation suits, grabbed their Geiger counters and masks, and in silence drove the windy path across the broken basalt beds to the Stationary Low Power Reactor One (SL-1).

They had prepared for radiation, since the warning was tripped by the presence of unacceptable levels inside the small experimental reactor – the alarm pattern of two long rings and then a short one. Earlier in the day, the SL-1's fire alarm had gone off in an attached furnace building due to a faulty sensor, and Callister hoped that mechanical failure was again to blame.

When they arrived, they parked in the small lot with three other vehicles—cars belonging to the three men on duty that night. The dim lights from the reactor vessel cast a pale glow on the thin layer of snow, the call of radiation alarms the only sound between the men as they donned masks and gripped Geiger meters. The alarms were mainly an annoyance to the Health Physicists who heard them often during a day's shift. They could trip by what they believed was common background radiation, or such low levels to hardly register on their counters, and there was rarely anything to worry about, so the logic went. But when Callister looked down to his counter for the first time, still a

good fifty yards from the entrance to the control room, it had pegged at 500 roentgens per hour. Believing he had a faulty device, he asked to see his fellow HP's counters – all were dialed to the max reading, a lethal dose of radiation if one were exposed long enough to it. In 1961, it was not considered necessary that a device read higher than 500, and to that point in Idaho, it would have been deemed as extreme overkill to measure that kind of radiation levels. As an HP, Callister knew his yearly allowable dose was 5 roentgens per year, and no more than three tenths of one roentgen per week.

Still, Callister did not hesitate to enter the building, regardless (or perhaps because of), the 500 reading. The control room was empty, and the archaic looking instruments, like white clock faces, were all going haywire. His fogging mask made moving through the rooms difficult, but he was able to make out three lunch pails and three heavy winter coats in one of the rooms that led away from the reactor vessel. Despite these signs of life, however, he could not find the men on duty.

With such high radiation readings, the last place Callister wanted to check was the reactor room, but the evidence suggested the men were there. He had to find them above all else. When he stepped into the vessel for the first time, it would be the last time the US could claim that its experimental reactors held no immediate potential to kill. Callister found two of the crewmen, Dick Legg and Jack Byrnes, sprawled out on the floor, mere feet from the now open core, soaked in the radioactive water that had once provided the steam to power the turbines and cooled the core. The steam rose from the hot core where its central control rod had once been. There was shrapnel everywhere, and the core was spewing radioactive gas. He checked Legg and Byrnes for

life. Remarkably, Legg was still breathing. But his body was soaked to the bone with radioactive steam.

Callister got the man out somehow – though in his own recollection the procedures for doing so are quite blurry. Despite his selfless efforts, Legg died in the ambulance, covered a foot deep in lead blankets. His body was so “hot” that they had to drive the ambulance out to the middle of a sagebrush clearing, without any roads to guide them, and leave it there. Hundreds of yards away, the body threw off 500r, again the maximum reading for the Jordan Redectors. It was an unthinkable dose, and the drivers received more radiation in the five minutes it took to drive the ambulance out to the sage brush flat than they should have received, according to the acceptable limits at the time, in the space of 15 years. At the time, Callister’s own exposure, coupled with the terrifying scene and the heat from the vessel, rendered him in what he can only guess as shock. But a third man was still to be accounted for. Although he tried to go back into the vessel to find the third man, Richard McKinley, his fellow Health Physicists would not allow it, which is just as well. He had witnessed enough tragedy and been over-exposed. The hunt for McKinley’s body would have to wait until morning, and because the core and immediate area was so hot with radiation, it would end up taking two days to find him.

When the rescuers did find McKinley’s body, they could not believe what they were seeing, for when they re-entered the vessel and climbed the circular staircase up the side of the vessel to the top of the rafters, they found Richard McKinley’s body

draped over a rafter in the center of the silo shaped ceiling, impaled by one of the core's missing control rods.

By 9:40 PM, nearly an hour after the explosion, Callister was taken directly to decontamination. He was scrubbed down and every article of clothing, including his watch, was taken and placed in a 55 gallon drum bound for an underground repository, where most of the radioactive remains of the SL-1's dead crewmen would, in time, also be placed. His clothing alone was registering off the charts.

His radiation dose was first estimated at 13R, well over double what was acceptable at that time for an entire year at 5R. Later, however, that initial dose would be reduced to 7R on Callister's official record, since the Atomic Energy Commission believed that his anticontamination suit would have blocked the beta form of radiation. The reduction in radiation dose eliminated the AEC's need to remove Callister indefinitely from his Health Physicist position. Instead they assigned him to work outside of the reactor areas for one year, since he had already maxed out his safe radiation exposure levels for that year. Lovell Callister was happy to oblige and even happier to keep his job.

In the aftermath of the first deadly nuclear accident, another man's work emerges. Steven Cathy is a mechanical engineer by training, but his theoretical training at Idaho State University had not prepared him for the dangerous work of cleaning up after a nuclear accident. After the initial rescue operation to get the men out of the reactor, AEC officials deemed the SL-1 as too dangerous to enter for the time being. The open core still spewed untold amounts of radiation into the atmosphere and there was

deep concern that another explosion could happen without warning. But Richard McKinley still hung from the vessel's rafter, with a control rod hanging from his pierced abdomen.

Although there had been many intentional meltdowns and other potential hazards happening routinely at the Nuclear Reactor Testing Station in Idaho, the SL-1 accident came as more than a shock for nearly everyone in the nuclear industry (See *Stacey's Proving the Principle*, Robert Gillette's "Nuclear Safety and the Fall of Phillips Nuclear). However, it came as a revelation for some who had been living in a Candyland version of nuclear reality, but for Cathy, who was charged with retrieving the body of Richard McKinley, the accident presented an engineering problem that defied all training. Cathy had been assigned a job to do, and he would take it up gladly and with characteristic patriotism so common at the NRTS.

The radiation levels remained higher than any ever to be recorded in the Idaho desert, even days after the accident, and the body of McKinley was as hot as the core itself, so Cathy decided to engineer a way to remove McKinley without entering the vessel from the front door and exposing everyone to the melted core directly—plus the added problem of somehow detaching his body from the ceiling without actually handling the body and the control rod.

Cathy designed a contraption that looked more like an Idaho potato conveyor belt than anything, but it worked. By that time, the HP's monitored the radiation exposure closely. The work that Cathy and his team did took longer than he wanted it to because they could only spend about 60 seconds at a time near the SL-1. In Cathy's

engineering mind, he had a job to do and the HP's, with their Geiger counters and constant harassment, got in the way of doing the work. For Cathy, what he couldn't see, touch, smell, or taste, was mostly unimportant if it meant he could not complete the job of retrieving McKinley from the vessel with engineering precision and efficiency. In some ways, the cavalier attitude regarding the dangers of radiation was something many of the men at the NRTS held—Cathy himself saying that, “mostly sissies worried about it.”

Finally, however, after a lengthy and drawn out process of cutting a giant rectangular hole with a blow torch in the side of the reactor vessel's sheet metal siding, and maneuvering the contraption with controls from the outside, Cathy collected the body. He and another man, a truck driver who worked for various departments at the NRTS, drove the body of Richard McKinley (cased in a lead box), to the holding place of the other two victims. His final work on the project was engineering a way to move the body from the lead box to a holding tank, where the bodies of Jack Byrnes and Dick Legg lay torn and frozen in a giant tub of ice water and alcohol. But NRTS administrators determined that it would be too dangerous even to attempt, so instead they increased the lead shielding and found an out of the way corner where they could place the lead coffin.

The bodies of all the men would lay and wait for a gruesome autopsy, performed by doctors shielded yards away by a lead wall, using hack saws and medieval looking devices to cut away the heads, organs, and other body parts. While there was general interest in the men's tissue and organs for scientific reasons, the main objective was to

cut away enough of the radioactive tissue so that whatever remained could be returned to their families for burial. The easier thing to do, and what many officials at the NRTS wanted to do, was dump the bodies into steel drums and bury them with the rest of the radioactive waste being stored in the belly of the Lost River Desert. Yet that plan did not sit well with AEC officials who wanted to preserve as much as possible the goodwill and trust of pro-nuclear America in 1961. Despite their best efforts to give the men and their families a proper burial, all of the men's graves required special preparation—lead coffins and several yards of concrete. The better part of all three men ended up, however, in steel drums and buried with the SL-1's remains.

For Cathy's part, he said he stopped wearing the Geiger counter about a day into the job. "It was no real danger; it just made the HP's paranoid," he says years later. Yet even on the short drive to deliver the body, the truck driver's counter was picking up substantial readings from the radiation emitted by McKinley's remains. They both had a good laugh, given that his body was cased in six inches of lead on all sides.

Cathy's exposure was never counted or assessed officially by the AEC, aside from the normal analysis of the ionization patch counters that, according to Cathy and Callister, workers often didn't wear when the threat of exposure was at its greatest, and since the HP's were monitoring it throughout the SL-1 recovery operation, he didn't wear one when they weren't around. Cathy's main job entailed pipefitting and other engineering duties for new construction of nuclear reactors. He was a busy man, since there were some 50 reactors already constructed and in various stages of operation, or

being built, or proposed in the next five years at the NRTS. If he lost his clearance to enter these reactors because of overexposure, he might be sweeping floors.

And for Cathy, and for many who I talked to, he may as well have been retrieving a sack of potatoes atop the reactor vessel. His job was to engineer a way to do it and to carry it out without having to manually handle McKinley and the control rod, and he did it with requisite disregard for the human tragedy itself, but also with a necessary apathy for what the accidental explosion might hold for the unfolding narrative of nuclear science and safety.

Meeting Lovell Callister

What motivated Callister to enter that blown up reactor when every measuring device available to a Health Physicist told him not to? The various ways we might answer that question leads to a relatively unexplored problem of the human condition: To what extent are people guided primarily by a sense of trust in their experience. I had to meet the man before I would learn the answer to that question.

The first time I met Lovell Callister, I was driving by his family's dairy farm in Blackfoot, Idaho, just 25 miles east of the NRTS (what is now called the Idaho National Laboratory, or the INL, or simply the "site" by locals) along the banks of the Snake River. He was driving toward me, head on in my lane, looking over his 300 head of heifers waiting to be milked, not once looking up, and I somehow slid my little car into the

barrow pit at the last second, watching the little yellow truck as it weaved and sputtered past. He never saw me.

When I finally tracked him down, he was limping along the feed trough, watching the cows eat. He was hunched over and saying something kind sounding to one of the cows when I approached, something one does not hear often between humans and cows in that part of the world. He was 87 at the time, banned, I learned later, from driving at all and especially the quarter mile from his new modular home on the edge of an alfalfa field to the farm, which he “only did daily,” he said. The family had moved him and his wife off of the farm to keep him from working so much. They feared for his safety after he had been kicked by a bull, and, given our first meeting, I could understand their concern. Still, his was the most ironic sort of frailty. He could hardly walk and stand upright, but was tough all the same—one grasp of his meaty right hand was enough to suggest that in his prime, Lovell Callister was the quintessential man’s man.

I didn’t tell him that he had nearly killed us both. Instead, I shook his thick hand and thanked him for the chance to meet and talk to him. Aside from the AEC committee interviews, I was the first to ask him about the SL-1.

His is a familiar lineage in the small community of Blackfoot – the son of Mormon pioneers who had left Salt Lake because his father had been called through divine providence to go and help settle other communities for the growing Mormon population. He found it, along with many of his brethren, in Idaho’s Lost River Desert. It was more bountiful and rich in resources than anything the Saints had witnessed in Salt

Lake. Perhaps more importantly, the vast plain was isolated, and thus insulated. The desert's soil is dark and rich with volcanic ash, and once stripped of the sagebrush, the possibility for farming, with the abundant water from the Snake River and fertile soil, seemed boundless. It wasn't Brigham Young's declared Zion, but the landscape surely reflected God's will for a prosperous people.

Callister grew up there, on the edge of that great expanse of plain, on a small farm, just as all the kids in the area did at that time, and it was here he learned the ethos of hard work, trust in authority, and trust in experience.

Thus to understand Callister's impulse to rush into that radiation field on January 3, 1961, created by the first deadly explosion in history, one must consider the ways in which he conceptualized his work to include an unusual level of trust in his own experience to decide to enter it. Indeed, even in 1961, the available technology quantified the field's radiation intensity at the maximum reading of 500 Roentgens per hour – a measurement that would read much higher with current equipment -- and it was at that time considered lethal in certain quantities. Callister understood as well as any Bachelor degreed person who had been trained in chemistry and later by the AEC that radiation is deadly if exposed to it in certain quantifiable doses, but as certain as the science seems to have been at the time, the culture of experimentation that permeated every working condition at the NRTS thrived on uncertainty. Exposures, the instruments with which they measured doses, and the short and long term health of atomic workers were all indeed part of this extended experiment. Workers such as Callister were employed to keep track of radiation, not make critical judgments.

What then motivated Callister to enter that blown up reactor, when every measuring device available to a Health Physicist told him not to?

Callister's job at the NRTS, after all, was to monitor and ultimately protect the lay workers from overexposure to radiation at all nuclear facilities. His job required an acute sense of trust in the equipment he used to monitor and gauge radiation hazards and exposure, and he was the kind of man to take honor and pride in such a distinction. He was employed by Phillips Petroleum, a private contractor hired to build and run the Materials Testing Station and several other small operations, including the US Army's fated SL-1, an experimental breeder reactor which had been designed to be a portable subarctic power station where Soviet attacks could be intercepted.

To illustrate the ways in which HP's such as Callister used and thus were compelled to trust devices built by the latest available technology at the time, we need only look to the personal monitoring badges worn by each employee of the NRTS. These badges, according to Susan Stacy, author of the government commissioned history of the Idaho laboratory, were issued by the HP's to monitor and regulate personal radiation exposure. These ionization chambers could tell an HP how much radiation a worker had been exposed to in a day, a week, a quarter, even a year. Both the AEC and the NRTS had determined maximum exposure limits within given periods of time, and every employee at the NRTS wore them and surrendered them for inspection at least quarterly. One of the main jobs of the HP's was to analyze the badges and log exposures in addition to overall random monitoring, including responding to high level radiation leaks.

Callister also used a Geiger counter to measure radiation levels. He used the counter every day while doing the job of an HP. The use of the tool at the NRTS was as commonplace as a carpenter using a hammer. It was a trusted instrument. The device read information about the unseen world around him and thus became as integral to his work as an X-Ray machine to an orthopedic surgeon. Yet Callister dismissed the first Geiger counter measurements. Regardless of what he had been told about radioactivity and its potential in the wake of a meltdown, his trust in the instrument did not corroborate with the information he had obtained from the real world of nuclear testing at that time (nobody had in the kind of mid-management position he filled in the early days of nuclear testing) the meters did not even read above 500. How was radioactivity at that level even possible? And what did it mean to be exposed to it?

Frankly, the possible answers to these questions did not play a guiding role in the ways in which Callister acted in that decisive moment on that sub-zero night. He used these devices to basically gauge the exposure level of personal radiation for each employee at the NRTS and could still, at 87, recite the exposure limits in weekly, monthly, and yearly doses. Somehow that knowledge – and the rationale for setting these limits – did not deter his decision to act. His unfailing trust in that Jordan counter did not help him interpret the extreme risk he was taking by entering the SL-1. I want to understand how that moment led to him entering the reactor, what compelled him to distrust his training in chemistry, his training with the NRTS, and the instruments used to carry out his job?

One of the first questions I asked Callister, after we had talked a bit about his cows, is if he had trusted the instruments he used to monitor radiation. I remember that he glanced away for a moment, reached down and picked up a handful of hay that had fallen from the trough and fed it to one of the smaller heifers. "I guess I did," He said. "There was protocol, data to enter, and that's the tools they gave me. I didn't have reason to trust in anything else, if that's what you're getting at." He must have sensed that I wanted more because he reached down for more hay and fed the smaller heifer, and then began again. "If it's trust you want to talk about, then it's pretty simple. I trusted everybody out there cause it seemed like they knew what they were doing," he said, laughing.

I began reaching down to pick up handfuls of hay for the small heifer. She was a nice distraction from the intensity of recollecting these memories. Clearly, Callister knew the personal risks in a mathematical sense – or a way that could be collected by his trusted instruments and logged into a personal file that correlated to radiation exposure, and that would then be determined by a number – or, as he referred to it, a dose. So then why enter the reactor when it went against everything known that could be measured by the instruments of your trade?

After hearing the question, he looked at me square in the eyes, straightened his back as much as he could muster and said, "Nobody ever asked me why." He smiled. "Nobody wanted to know nothing except what I did in that reactor. And I told the AEC people and a few others, and that's it. They give me a medal for it, and it was nice. I

still don't know why I did anything special. But you, you want to know why ... I might have to think on that a minute," he said.

By that time most of the cows had fed and had wandered to their stalls, where they would lie on a thick bed of straw until milking began at 3:00 AM. In the fading light, I explained that in my field of research we were often trying to understand how and why in certain moments people trust, believe, see, and act in the ways that they have. To which he replied, chuckling, "I didn't need you to explain yourself. Just thought it odd that in all these years after, nobody but you wondered why. At that time, I don't think it was ever questioned why I did it, but I should have been asked it by now." I of course agreed, and we both had a good laugh. "Let me show you something," he said, hobbling toward a bright gold field of grain. I followed.

He stopped at the edge of the grain, spun to gold by the heat and the sun, and held his gaze toward the Big Southern Butte, an ancient volcano rising 2,500 feet above the sea of open plain, the Idaho National Laboratory (the current name for the NRTS) somewhere in its shadow, and, after a long pause, said, "Worked as a kid on dad's farm, I lived here my whole life, started this dairy with 8 cows just after I started working as an HP, and now my sons have grown it to 300." He paused and looked at me. "You're a Kmetz, so I know your dad taught you about work."

"Yes, he did," I said.

"That's good. I don't know that anything in life is as important as hard work. Those guys I worked with at the NRTS, everyone, the scientists, the engineers, the laborers out there worked hard. I worked hard and didn't ask much in return except

what I'd earned. I didn't ask a lot of questions; just put my head down and did it. Nowadays I think work is different. And you want to know about trust, well that's different, too. We had jobs to do and we did them with honor, the same way I came home and kept up this farm. You go look at some farms and I'll tell you how trustworthy the guy is just by the look of the place."

He paused and took some deep breathes, clearly laboring to keep up the physical strength that his quick mind deceives, reaches down and plucks a head of grain and presses it to his nose, and says, finally, "I entered the SL-1 because it was the right thing to do. The instruments and everything else didn't really matter, at the end of the day. They were reading things we didn't even have the training to understand anyway. We knew there was something happening inside that reactor and that three men were said to be working the shift. The firemen hadn't got there yet and we didn't sit around waiting for them. We had work to do." I squinted into the final beams of sunlight and nodded.

As we walked slowly, each step a challenge, back to his little pickup, Lovell mentioned, "It's been maybe twenty years ago or so now when these two lawyers in black suits showed up at the farm looking for me, wondering if I was healthy. I told them I was as healthy as any other old dairyman around. They asked if I ever did have any health problems. Guess they were planning to sue on behalf of a few other workers and community members. They came lookin' for me to see if I wanted to make some money on the deal, I guess." When we reached the truck, I asked him what he had said to the lawyers. "Same thing I told you. We had jobs to do and we did them with honor,

the same way I came home and kept up this farm. I got paid well for that work, was grateful for it. I'm not owed anything by the government that they haven't already paid me."

By that time, I worried about the half mile drive that Lovell had to make back to his home, where his wife was preparing his dinner and, no doubt, worried where he was and that he would not make it back. "I'm not supposed to drive anymore. That's what they tell me, but here I am" he says, as he climbs into the little yellow Chevy Luv pickup. I nod and smile and thank Lovell for his time. As he leaves the farm, I watch the red lights weave in and out of the lanes, until finally they turn toward the new home in the middle of his alfalfa field and rest, motionless, in the driveway.

Meeting Steven Cathy

Steven Cathy is a tall and stout man, even in his late 70s, and as I approached him on a late Idaho summer day, I wondered if I had his age noted correctly. I had traveled from my current home in Montana to the edge of the Lost River Desert to talk with him about his role in recovering the impaled man's body from the SL-1. While there are some first-hand accounts of the recovery efforts, they are all published in official documents and government publications. And because he and Lovell Callister know each other well, he had agreed to meet because Callister told him I was "still okay for a liberal."

I felt that his experience was best taken from his own account of it because the technical information of how the body was extracted is the only published data. But I want to know what the experience was like for him, in essence, all these years later.

Cathy is largely a nomad in retirement, wandering around the southwest in his giant fifth wheel RV for months at a time between his frequent returning to the Idaho desert to visit his children and grandchildren throughout the year. He and his wife rarely if ever miss a graduation, a baptism, a birthday. They raised five kids together and have 21 grandchildren and 15 great-grandchildren. His devotion to his family is what allowed me to sneak a few minutes of his time at his great granddaughter's Mormon baptism party. Prior to that time he had been living in an RV park in Las Vegas for a month, golfing every day, and when I had set up the time and place to be interviewed (at his granddaughter's home), he asked if I minded the circumstances, and I of course said no.

His work in retrieving Richard McKinley's body down from the reactor vessel was the kind of work that no formal training could have prepared him for. Most of his work in the early days, prior to the explosion at SL-1, was in reactor building. He is a mechanical engineer by trade, educated at nearby Idaho State University, and worked mainly on fitting and diagramming the various pipes used in a nuclear reactor – considering the 52 experimental reactors in operation and under construction when he began work in 1959 – he was a very busy man.

“So,” he said. “You’re doing some research on the SL-1, or so Lovell told me a few weeks ago.”

“Something like research,” I said, feeling a bit like I was the one about to be interviewed.

Sensing my hesitation, Cathy quickly added, “I think it’s great what you’re doing. At the time I didn’t think much of it, really, but looking back I see what a big deal all of that was. Nobody but the AEC ever really wanted to know what I felt about it. I heard of some books that got published about it not long ago. You’d think that someone would want to know about how we got that poor guy off the roof of the reactor, but nobody ever came knocking on my door.” It became very apparent that Cathy wouldn’t need many questions to get him going, and so I started by asking how he felt about his work at the NRTS. He did not skip a beat.

“That work on the reactors was the fun stuff; the really good stuff. We might have had our degrees, but a lot of us were still just Idaho farm boys working on the most cutting edge technology in the known world. There was energy to the work. It came from all over. We were hungry for work. There was so much money, like it came through its own pipeline to the desert. But once the work started, that’s when we realized we weren’t just doing some pipefitting. This was cutting edge stuff, and with such excellent material. Any man lucky to get on did his job with a smile, and you can bet I did.” He stopped briefly to catch his breath, stood up, and continued, “That’s the truth, too, nothing like it today, I tell ya,” he said, waving his arms. He led us to a quiet bench beneath an elm, where we could overlook the Lost River Desert and the buttes.

As we sat, he continued. “Yeah, we were happy to have the work, that’s for sure. But we were not just fitting pipes; we felt that we were doing a service to the world by

building the reactors,” he said, just seconds after I had sat down with my recorder and opened my notebook. I hadn’t even asked a second question and soon found that I would not have to. Of course I recognized the same zeal in his voice from many who I had talked to about their work at the NRTS, including Lovell Callister. It was humming with enthusiasm, for the work, for the money, for the new era of the atom and nuclear scientific promise, a promise of not only American prosperity, but world prosperity, peace, and, yes, economic and militaristic dominance.

By that time, Cathy had been retired for nearly twenty years. He gave 38 years to the NRTS, worked 4 day 10 hour shifts, not including the two hour bus rides in and out of the Lost River Desert. He began and raised his family during that time and did so with uncommon ease with his government benefits and middle-class wages that are so envied in rural Idaho. Watching his huge family converse and play on that summer day, I could see why he felt such warmth about his work at the NRTS because it began what would become a legacy of prosperity – good homes, safe neighborhoods (yes, there are still those considerations in Idaho), the best schools, good clothing, straight teeth, and still some coveted time to gather and enjoy this legacy as a family. And perhaps no other kind of gathering than one to celebrate a rite of passage in the Mormon faith would have revealed this legacy with such vivid evidence.

Regarding his work at SL-1, Cathy seemed very matter of fact in his responses, despite the grueling details. “We knew the job was to remove a dead man from the reactor vessel. It was a job and we could handle that. The main problem was not the dead body, but the amount of radiation being thrown off of the body and especially that

control rod that impaled him—who could have planned for that?” One of his great-grandchildren jumped into his lap and squeezed his neck. He wrapped a lanky arm around her. “The scene was straight out of a science fiction movie, really, and I guess that is what strikes me most about it looking back—at the time that man stuck to the roof was an engineering problem, not a human problem, or a problem for the AEC or anything like that. My job was to rig something up so that we could get him down without having to handle the body, simple as that.”

“But what, I wondered aloud, did you think about carrying out the job? Were there risks?” He let his granddaughter down and took a long drink of what looked like Kool-Aid.

“There were risks, I guess, so the HP’s like Callister always told us, and they tried to keep us from being anywhere near the whole building for more than a couple of minutes at a time. We had these quarterly doses that we could get. We didn’t think much of the doses except that if we got too much, then we couldn’t work in the reactors until the quarter reset, and we didn’t want that, so a lot of times we didn’t wear our badges unless the HP’s were right there watching us. Nobody I worked around seemed to worry about the risks. We didn’t really even talk about it unless one of us had reached our ‘quarterly limit’ and got assigned to some other job that paid less for a few months and you had to do some really terrible job. We wanted to be working on the reactors. That’s how it was with everything out there – everything was experimental and it was pretty exciting to be a part of it.” And across all of the years since 1961, I could hear in his voice the enthusiasm he maintained through all of it.

By that time, the afternoon had faded to evening, and I did not want to keep this fine man from his large and beautiful family any longer than I had already. We had sat on that bench and talked for nearly three hours, and I got to ask two questions. I had not sat down with him knowing what I wanted, exactly, from the discussion, but as he held forth, that became more and more clear.

Risk and Trust in Experience

Why Callister entered the SL-1 is of course central to this inquiry because of the perceived trust in the instruments that read the dangers in the unseen world at the NRTS and the data these devices produced. That night the technology produced data suggesting that he would be in extreme danger of radiation exposure, and trust in this technology was central to building the bright new world of the Nuclear Reactor Testing Station in the wind-burnt plains of Idaho. Still, his trust in work, his trust in his own experience in that moment, and his unflinching trust in authority figures was far more powerful than a hand held radiation reading device.

The perception of risk and decision-making based on a largely experiential model for determining the potential for personal harm is thus phenomenological in nature, what the ancient Greeks called *phronesis*. This potential for harm is complicated further by the socialization of experience through trusting vital components of experience: a shared *ethos* of work, trust in authority, and, in this case in particular, spirituality. The world, in this line of thinking, is taken for granted as physical and

objective through a process of socialization and everyday experience. Viewed this way, developing trust is based on socialization and personal experience and is then temporally as well as socially based. In “Scientific and Everyday Knowledge: Trust and the Politics of Environmental Initiatives,” Gavan McDonnell suggests, “The primary ingredients of the ... management of risk and uncertainty in everyday life ... turns out to be, not knowledge and rational choice, but trust and experiential judgment” (822). This argument provides insight into Callister’s decision-making process because it highlights affective dimensions of trust.

As noted above in McDonnell’s research, what seems most compelling about this field of study is that the ways in which most of us perceive and manage risk has very little to do with rational, logical choices guided by empirical data.

I first want to develop this argument briefly through some of the more recent research by Paul Slovic and colleagues on risk and decision making and also touch on phenomenological research on scientific and everyday knowledge. These are rich theoretical traditions, and so by no means will this treatment be comprehensive, but it will shed light on the ancient concept of *phronesis* and the SL-1 recovery efforts.

In Paul Slovic’s “Going Beyond the Red Book: The Sociopolitics of Risk,” he frames risk through the multidimensional and contextual nature of risky decisions. Thus risk takes on what Slovic describes as “the contextualist conception of risk,” which he defines as follows:

On the contextualist view, the concept of risk is like the concept of a game.

Games have time limits, rules of play, opponents, criteria for winning and losing,

and so on, but one of these attributes is essential to the concept of a game, nor is any of them characteristic of all games.... A contextualist view of risk assumes that risks are characterized by some combination of attributes such as voluntariness, probability, intentionality, equity.... The bottom line is that, just as there is no universal set of rules for games, there is no universal set of characteristics for describing risk. The characterization must depend on which risk game is being played. (86)

He goes on from here to argue about the limitations of risk science because of these contextual factors, which highlight the experiential dimensions of determining *rightness* as an ethical response with some perceived beneficial outcome. For Slovic, whoever defines the risk game exercises the power. Danger, he suggests, is the stuff of reality, but "risk is socially constructed." Within these social constructions lies his argument that, "If you define risk one way, then one option will rise to the top as the most cost-effective or the safest or the best. If you define it another way, perhaps incorporating qualitative characteristics and other contextual factors, you will get a different ordering of your action solutions" (1187), and thus the power is held by those who construct the accepted definitions risk.

In Slovic and Peters' later study, "Risk Perception and Affect," they argue that humans have two basic ways of dealing with these definitions of risk and in essence playing the risk game as discussed above. Slovic and Peters suggest that we perceive risk in the following ways: Risk as feelings and risk as analysis. While both of these perceptions of risk do come into play in the SL-1 explosion, risk as feelings points to the

immediate and experiential ways the responders made decisions, for they had little time to make analytical decisions despite the evidence gathered from the available data – all of which suggested that they should not enter the building.

Slovic and Peters' research suggests that what they call risk as feelings is “the predominant method by which human beings evaluate risk.... Most risk analysis in daily life is handled quickly and automatically by feelings arising from what is known as the experiential mode of thinking” (322). This experiential model is guided by intuition, instinct, and a sensory emotion Slovic and Peters call affect of “goodness” and “badness” as a feeling. This feeling can either be conscious or subconscious, but the feeling becomes a qualitative emotion that senses and responds to danger in what is clearly a risky situation or a context in which the feeling of risk is accompanied by this affective quality:

The finding implies that people judge a risk not only by what they think about it, but also by how they feel about it. If their feelings toward an activity are favorable, they tend to judge the risks as low and the benefits as high; if their feelings toward the activity are unfavorable, they tend to make the opposite judgment—high risk and low benefit. (323)

Slovic and colleagues go on to suggest how the affect heuristic of responding to risk often misleads people about the true, analytical dangers present in risky situations. It is, however, interesting to see how “gut” responses to perceived danger translate to good and bad feelings that seem to motivate decision-making.

In a related study “Gut Reactions: Moral Convictions, Religiosity, and Trust in Authority,” Daniel Wisneski et al. suggest that when strong moral conviction such as morality tied to work ethic are at stake, “people are more likely to believe that duties and rights follow from greater moral purposes than from the rules, procedures, or authorities themselves” (1059). Thus the responders of the SL-1 explosion seemed guided by two experiential phenomena with regard to the risk—their affective feeling states, gut reactions, and morality tied to work and a sense of duty.

Practical Wisdom

Place and time are inseparable, for time must pass in context, but we also give meaning to that time as it passes, and that meaning often determines what happens (or doesn’t) in a place. These meanings can seem ethereal or ineffable but are, at the same time, evocative and affective giving rise to action and thus furthering the notion that place is as much an ongoing construction as it is a physical one.

As a chemist by training, Callister knew the theoretical risks involved with certain radiation exposure, and yet in 1961 radiation was not as feared as it would become decades later. There are of course many reasons for this development of fear, some of it no doubt coming out of the realities of long term, low-dose exposure in addition to a more critical eye turned to the work of the Atomic Energy Commission after decades of nearly limitless power. Still, even for 1961, Callister held as much understanding of radiation as they were sharing at the university level. He had gone through many AEC

trainings and his work as a health physicist was to maintain the health and welfare of his fellow nuclear workers and he obviously took that work very seriously. Still, as Susan Stacy suggests, safety standards were often divided between effective and strategic use of human resources, “Another reason for preventing workers from exceeding exposure limits was to avoid having to transfer them to non-nuclear work, a significant administrative annoyance” (59). One reason Callister and the other HP’s inspected the radiation badges each worker wore was to avoid this annoyance.

There seems to be, in other words, competing interests regarding the work of the HP’s in the grand scheme of the NRTS’ mission of experimentation with this relatively new and exciting science of the atom, even as they were charged to monitor and look out for the safety of his or her fellow worker. On January 3, 1961, clearly the choice to distrust the devices that governed his day to day decision making was one made through his trust in experience and born of necessity, just as Slovic and colleagues would argue regarding the affective feelings rising from duty, work, and the “goodness” of carrying out the rescue efforts.

Callister had been given a job to do by his ranking superiors -- the authorities who also worked for Phillips Petroleum, who had been contracted to build and maintain several important nuclear reactor projects via the NRTS, and, ultimately, the Atomic Energy Commission. In the moment, the sense of risk as displayed by the Jordan instruments could not compete with the experiential, phenomenological gut feeling that “if you can’t see it, then it can’t hurt you.” That Callister did not trust the initial Jordan instrument reading at 500r and requested a new instrument suggests he trusted

experience over the device and is further reinforced with statements such as the one made in our interview: “If it’s trust you want to talk about, then it’s pretty simple. I trusted everybody out there cause it seemed like they knew what they were doing.” Steven Cathy said nearly the same thing about trusting his experience: “We had a job to do and we all knew what we were doing and how to get it done.”

In my interviews with Callister and Cathy, I went in thinking that perhaps I could never understand, or be convinced, that the decisions made in the aftermath of the SL-1 explosion were the right choices. But I was struck by their self-assurance and expertise—the ways they described these practical decisions seemed, oddly to me, as the only correct actions to take at the time.

Paul Schuchman describes practical wisdom as “the excellence of moral knowledge, a knowledge of right action that is distinct from technical knowledge and that cannot be learned in the way that technical knowledge” (qtd in Kinneavy and Warshauer 179). What is right, I came to understand from these men, cannot be determined independent from the specific time and place where the action took place. I experience the SL-1 from a historic perspective mainly through technical knowledge, and most of it filtered to argue one set of circumstances over another. What I gained from Callister and Cathy is an appreciation for the moral knowledge that infused their work with meaning. There are many complex components that go into the making of that moral knowledge, which I hope has become clear in previous chapters regarding Mormonism, an ethos of work, etc., but until I heard it straight from the horse’s mouth, so to speak, I could only experience it in an academic sense.

Had I been working with these men on January 3rd, 1961, and been called out in the sub-zero weather to investigate a strange warning signal from the SL-1, I would have trusted these men to lead by example and that they would do the right thing.

The Dream That Failed: The Legacy of The SL-1

If we can see it, the real landscape of hope is already here. It's just on a smaller scale than we thought ... but I don't think we'll be able to see those things until we've created a civilization where we try to repair the damage that acting in our own narrow self-interest has done to the place where we live. It'll be a place where we can grieve for all the dreams that have proven false.... It'll be a place where time is seen in terms of generations, and decisions are made for great-grandchildren. It'll be a place of small good things, because all the big good things have all been used up, or killed off, or shown themselves not to be so good anymore.

—John Rember, *“Writing Place,” MFA in a Box*

A short time after the SL-1 exploded, President Kennedy shut down the Air Force's pursuit of an atomic airplane. Not long ago, I stood in the long shadow cast by the old bones of the prototype that stand as a memorial near the Experimental Breeder Reactor One, the first nuclear reactor to power a city. It stands in the desert like a piece of machinery from a *Star Wars* film. The Army's nuclear program slowed dramatically after SL-1, until by the early 1970s the pursuit of a nuclear powered fleet of tanks, trucks, and railroad engines completely died. The domestic promise for nuclear power kept the experimental reactors in business for a bit longer, but by the early 1980s, the dreams

that grew out of Seaborg's imagination for a nuclear powered world turned out to be just that—dreams.

According to John Tierney in the *Science* article, "Take the A-Plane: The \$1 Billion Nuclear Bird that Never Flew," many argue that the trajectory of the nuclear program began its demise with the SL-1 accident, and the evidence suggests that interpretation of history. In the aftermath of the explosion, of course the search for how and why it happened ranged from simple mechanical failure with the reactor itself, to espionage, and, remarkably, to a murder/suicide conspiracy theory.

Aside from just a few indisputable facts, however, why the SL-1's central control rod had been pulled suddenly beyond the routine four inches required for routine maintenance remains a mystery. What is known about the events leading up to 9:01 PM on January 3rd, 1961, conclusively is that routine maintenance was scheduled on the reactor, and a start-up procedure would follow after the reactor had been shut down over the holidays. According to Dick Legg, Jack Byrnes, and Richard McKinley's log of nightly work, all but one of those procedures happened that night without a hitch, as noted in their procedure log for the shift's work. The final job of the night required one of the men to manually lift the central control rod from the core to a height of 4 inches so that it could be hooked to the mechanical lifting system. We know Jack Byrnes wrapped his hands around that rod at 9:01 PM and pulled.

At 9:07, Lovell Callister and another HP drove the short distance from the Chem Plant to the SL-1, responding to the warning sirens. What they found were three dead

men, a melted reactor core, and a lot of unanswerable questions about how it all happened.

The historian Susan Stacy observes that in the aftermath of the first deadly nuclear explosion on American soil, the SL-1 holds a sort of legendary status already, perhaps even mythical. Add to that legend and mythology the questions: “Did one of the cadremen deliberately withdraw the control rod, and if so, why? Or did the control rod stick, causing over-exertion and a sudden release? All of the science at the NRTS was unequal to this most perplexing question” (156).

Nevertheless, these two theories of what caused the rod to be lifted an estimated 18 inches instead of 4 take separate paths in prescribing blame – human or technological. Of course, in the infancy of the nuclear program, technical problems that resulted in death and a massive release of radiation were not good for public relations. A human error, or one caused by malicious intent, was viewed as less threatening to the AEC. Both theories, however, are well-supported by the evidence, and so it largely comes down to what one chooses to believe—this judgment, too, relies mostly on affective feelings.

The known evidence for a human-caused disaster is the following: Jack Byrnes received a phone call from his wife at 7:30 on Jan. 3rd. According to Brynes’s wife’s own account of that conversation, the couple had decided finally to end the marriage (after a very turbulent two years since arriving in Idaho) and discussed how the final paycheck would be split. Byrnes disliked Dick Legg for a variety of reasons, not the least of which was because of an incident at a party where Brynes and Legg got into a fight over

Byrnes' indiscretions with a prostitute. Shortly after this fight, Byrnes was passed up for a promotion that he had been in line to get. The promotion instead went to Legg, whose record was more temperate than Brynes's. It is clear from all who knew the men that they openly disliked each other. Byrnes had a reputation for acting out in rash and immature ways; he was impetuous, somewhat unstable, and could be unpredictable, and most of the verifiable witnesses lend credibility to these characteristics.

Still, as all the official reports of the accident document, the technical failures of the SL-1 were clear and ongoing (see MacGowan Report and AEC reports). For months prior to the explosion, crews had noted that some of the control rods were "sticking" during routine maintenance, and, more importantly, the central rod was one of them showing signs of wear because the boron was flaking off of the rods and causing internal problems within the core itself. This technical problem certainly lends credibility to the theory that the central rod "stuck," requiring Byrnes to have to jerk on the rod to loosen it. It is further substantiated when considering that the reactor had lain dormant for more than two weeks during the shutdown. It stands to reason that a sticking rod problem could worsen while inside the dormant reactor.

As might be expected, the AEC sought to exploit the murder/suicide angle as a public way of explaining the explosion. The newspaperman from Idaho Falls, Ben Plastino, followed the lead on this story and tried to establish some credible evidence for it, but in his own words "could not find one iota of evidence" (109). But still it remains a popular mythology surrounding the explosion, in part because of the AEC's willingness to give it credibility in its official reports following several investigations,

which even included a mock up recreation of the accident. A full-scale book was published in 2009 (*Idaho Falls*, see works cited), which sensationalizes the murder/suicide angle and presents that argument as the only way to explain the events of January 3rd, 1961, and the doomed SL-1. While an interesting read and well researched, to my mind it only adds more layers to the mystery to the human and technological explanations of the accident.

My father and mother attended Blackfoot High School in 1961; they had just gone on their first date in the winter of 1961 and were married four years later. And while most teenagers tend not to pay much mind to current events, one might expect that the atomic cities (see the chapter describing these cities and the location of the NRTS) would be humming with news of the explosion. Even the New York Times had printed a front-page story of the accident three days later. But when I mentioned that I was researching the SL-1 explosion, my mother asked nonchalantly what had happened. *The Idaho Falls Post Register* ran stories on the explosion daily for about two weeks, but like other tragedies, this one faded from the front page to the back pages until the matter seemed irrelevant even to report on.

There is very little evidence that the explosion resulted in anti-nuclear sentiment, especially from the atomic cities in east Idaho, and maybe some of the reporting had something to do with that phenomenon. Perhaps more importantly, it reflects the growing ease between the site and the atomic cities, for each seemed to benefit from the other and few questioned what happened out on the Lost River Desert as a matter of ritualized secrecy. The culture simply did not promote active inquiry in

nearly all facets of life, particularly so when it came to their good neighbor on the desert.

The fears and perceived risks of radiation have increased incredibly since 1961. There are no safe levels of radiation in 2014 stronger than the normal background radiation we all receive as occupants of earth. As noted earlier in some of the risk research done by Slovic and colleagues, some of this increase is rational and calculated based on science-driven data. We are wise to fear radiation from nuclear sources and we understand the risks involved much better than we once did. There is, however, an irrational response to nuclear technology as a probability Not quite sure what you mean by “as a probability” of risky situations (see Fischhoff, Slovic, and Lichtenstein). The SL-1 explosion began a very slow process of placing another image in the minds of most Americans, one that complicated the beautiful images conjured up by Seaborg and other AEC officials and reminded them more of the atom’s other face—the destructive mushroom clouds that leveled Hiroshima and Nagasaki. The Three Mile Island Incident, followed by Chernobyl and a growing anti-nuclear movement, sealed the fate of nuclear power proliferation forever, in America at least.

In Idaho’s Lost River Desert, the true damage to the environment from the explosion itself is only on the cusp of being fully understood, if it can ever be in technical terms. Acres of underground radioactive waste depositories threaten the Snake River Aquifer, the largest freshwater aquifer in the world. Radioactive isotopes have been found in the ground water as far as Boise in western Idaho. How to deal with the acres

and acres of transuranic waste, the remnants of more than 50 decommissioned experimental nuclear plants, nuclear aircrafts, submarines, and even the radioactive organs of Richard McKinley, Dick Legg, and Jack Byrnes, awaiting permanent storage, will be the ongoing question and legacy of the SL-1 and all that it symbolizes.

The SL-1 was unceremoniously bulldozed into an open pit about a hundred yards from the original site. It was covered by 3 It's generally better to write out numbers smaller than 100 feet of dirt, and a warning sign was placed near the road that once led to the reactor. But the SL-1's radiation lives on and will for generations to come. While its twisted remains will never again find use, in many ways it continues to fulfill the promise made to the atomic cities when the AEC decided to militarize the peaceful desert in Idaho, for now the mission of the NRTS, now called the Idaho National Laboratory (INL), has finally been called to account for decades of environmental poisoning. For the atomic cities, the INL still decides their economic fate.

The cover of the March 10, 2012, edition of *The Economist* shows a pastoral scene of rolling fields, like a soft, undulating ocean of green and gold. In the distance, the iconic cooling towers of a nuclear power plant rise from the gold and green fields; two children play in the foreground. In the blue sky above we read: "Nuclear Energy: The Dream That Failed." It is a scene straight out of Seaborg's imagination for the limitless power of the atom and its usefulness in transforming the world. In Idaho, however, things go on and on without a hitch as the atomic cities and the INL hum along with the hum drum realities of the dreams that failed along with their experimental nuclear plants. While

the nature of the work has changed, there is still work, and plenty of it – more now than ever, in fact, and that is unlikely to change anytime soon as waste from the failed dreams must be cleaned up.

An old high school classmate of mine, who I met at a local gas station while talking to several people for this project, drives truck for the INL. I had come from my mother's place and stopped to fill up before returning to Reno. He pulled in to the gas station at the edge of the Lost River Desert, the last one from there to the INL, with his giant semi, pulling huge cylinders with atomic warnings all around. These massive trucks and loads bearing atomic warnings are as common to see out and about as a potato truck in September in eastern Idaho. The two of us made small talk for a few minutes, and he mentioned the fortune to have gotten on at the site, suggesting that there was so much clean up work that he'd have a job for years and years to come. Indeed, he is right. Not only are they busy cleaning up their own messes, but they are also figuring out what to do with the waste from the Three Mile Island accident, sent to Idaho by rail, piece by piece.

The trucks are headed to New Mexico to yet another temporary storage facility, where they empty the waste that will wait for a more permanent home once again. Finally, he talked briefly about the good money to be had on the desert and climbed back into the truck. He makes a couple runs a week and gets his weekends off. He doesn't handle the hot stuff directly.

As I watched the truck drive off in the distance, another one pulled into the gas station and came to rest where the other had been. I glanced out to the Lost River

Desert, where the sun bleached the Twin Buttes in white light, and thought, in a moment of clarity, that if one dream had failed, another one continues for the atomic cities.

Lovell Callister died the day I began writing the details of our interview. My mother called later that night after reading the obituary in Blackfoot's *Morning News*. He is buried less than a mile from my family's home, and in the cemetery where my father also rests in peace. He was 88 and died from cancer. Apparently doctors were amazed by his resilience to the specific kind of skin cancer that first attacked his arms and had been there for years and years without trouble. While not a conclusive cause, they speculate that his radiation exposure was the primary cause of this specific type of cancer, although they could not explain why it did not take him sooner.

On Going Back

My grandmother's houses all seem the same. They vary in nearly every architectural way, and nothing about the houses is common, really, except that she lives in them for a time, though she never truly makes a home, not for long anyway. Take her houses in Phoenix and Wyoming, as examples. Her house in Phoenix was a little Spanish design, with hardwood floors and tiny windows, white kitchen cabinets and orange formica. In Wyoming, she bought a 15x70 Fleetwood, with old truck tires stacked on the aluminum roof, protecting the thin metal from the infamous Wyoming wind.

And when I enter her new house in Idaho Falls, a 1950s tract house built by the Atomic Energy Commission, I am unmoved by the haunting familiarity: the smell of her round-gutted poodle, Isaac, and canned salmon, the dim lighting, the soft click of her grandfather clock. In all, she has lived in and moved from twenty three houses. The essence of one lingers in another.

I want to understand what keeps her on the move. I have come to recover what's left of her memory.

She lives in the past these days. What's left of her once quick eighty-seven-year-old mind is found only in her recollection of her early life on the Salmon River. The years in between, more than four decades of rootless ambling around the West, arrives only in very isolated moments. But her life on the Salmon River is as vivid today as it was fifty years ago.

My grandmother putters in the kitchen: rooting in drawers, rattling dishes, muttering to Isaac. In the living room, I sit on a floral-patterned couch and scan the yellowing black and white photographs on one wall, the young faces held static in dime store frames. The other walls are white and bare. Her paintings are shoved in a corner, behind the television. On nearly every flat surface, she has randomly placed her blue glass ornaments—birds, rabbits, squirrels, vases, candy dishes, punch bowls. A week’s worth of mail rests beneath a blue bowl, each labeled with a “forward to” sticker.

She never throws a box away. Throwing a box away, I imagine, would be like planting a maple in her front yard. Unpacked boxes are stacked behind the oak table. Some of the boxes have been taped together so many times that they look like cubes of multi-colored packing tape. I know without looking, that she has packed the spare bedroom with empty boxes—these the artifacts, the gatherings, of the lost.

There is a picture of my grandmother. She stands near her first homestead cabin as a newlywed, Salmon, Idaho, 1937. Her first husband, Chester, must have taken the photo, still several years before the War when he worked on the cobalt mines west of Challis. She is seventeen, wearing bobbed hair and a dirt-stained dress. She squints into the camera and smiles. Her back is turned to the Salmon River, where the river’s familiar tongue forms its seasonal pitch, the background for all her childhood memories.

I imagine the late fall air wafting from the river bottoms, filling her lungs with the heavy scent of decaying salmon. Back in 1937, the Columbia had not been chocked by dams. All five species of salmon returned to the Salmon River, the glacial stream of

their birth. Many of the salmon ended their 1,000 mile journeys mere feet from my grandmother's cabin. From her kitchen window, she could have watched the males beat their bodies against the river bottom, digging shallow nests in the fine gravel. She could have watched the females lay their eggs. Moments after, she could have watched them die. Sadness must not attend a death of this kind. She is happy back then. I am moved by my grandmother's bright, smooth face.

The clock chimes.

I walk to the kitchen to see her fumbling with a can opener. *I'll get that for you, Grandma*, I say.

I can't remember if I fed Isaac?

I think you did; I don't think he misses many meals.

I just can't keep anything straight anymore.

You do just fine, I say, resting my hand on her shoulder.

I'm too old to be fine.

Come tell me a story, I say, *about the Salmon River.*

She says that she'd go back and live that way *in a heartbeat, in a tent if I had to*—open and facing the Salmon River's clean limestone walls. *In a heartbeat*, she says. And in that heartbeat, eighty-seven years of memory washes the room in a buttery wave of stories she occupies in memory.

She tells me that she and her sister would each take a handle of a dented washtub and drag it down the trail from their cabin to the river and dip it into the

current, slowed slightly by her father's crude dam. *Three times per day, ten on wash days*, and sometimes she would tie some fishing line to a stick and sink a nightcrawler to the bottom of the pool, push the stick deep into the moist bank, then leave the simple rod to come alive with the tugging of cutthroat—*not those wimpy little brookies we got in the creeks now*, she says. When she filled the tub next, she would, more often than not, pull the stick from the bank, bending with the weight of an exhausted trout.

Some ornery sheepherder used to run a bunch of sheep through our place. Without all the fences, it was easy to move stock back then. And dad didn't mind. If a sheep dilly-dallied too long at our place, it ended up on our dinner plates. That's just the hard truth of it. Once, when things were real bad, dad had gone to work in the cobalt mine, me and my sister found a sheep stuck in the pool where we filled the washtub. You'd have thought we were wolves, the way we pounced on its back. I don't even remember thinking about it. And it took some doing. We were just little kids, but we drowned the sheep. Fed us for two weeks. We were so proud of what we done.

I visit to listen to her stories, for these tales are the first and the forgotten of the nuclear age in America. My grandmother never understood what the element cobalt was or why it was valuable. And neither did her father or her eventual bright-eyed husband, just eighteen himself. The element mined for its unusual quality of absorbing radiation from an atomic explosion and continuing the devastation for years after the blast, also

sustained my family in the Salmon River Valley when the promise of free land turned out to be inhospitable for farming.

My mother tells me between visits, *she's losing her mind*. It's strange to say about a woman who can recall in vivid detail a childhood now more than three quarters of a century gone, but true no less. I have been asked three times in one hour if she had fed Isaac. Four times I tell her I live in Missoula, and that I write, *that's why I take notes, Grandma, I say*. My mother tells me that she doesn't live in the present anymore. Lately she's been reliving her youth through patches of memories, and she best remembers her childhood and early adulthood on the Salmon River and least remembers all the time after, a pattern of ritualistic movement that begins in Salmon and ends with her move to Idaho Falls, twenty-three in all, a half century span of time in places, and with people, who she no longer remembers.

Recently, she called my mother at 3:00 A.M. to ask her about a photograph she remembered giving to my father when he was just a child. First my mother let out a long sigh and laughed nervously, no doubt relieved that the voice on the other end of the line didn't say what they often do when the phone rings at 3:00 A.M. My mother answered her question by asking a series of her own, the most important of which went something like: *Chester panning for gold on the Salmon River? Now?* She said that she had lost track of time. *The full moon, she said, it looked like morning.*

I remember the photo. Her first husband, Chester, kneels in gravel, holding the giant saucer, balancing its weight on his knee. A limp cigarette droops from his tight-lipped grin. The Salmon River pours over his left boot, and his face is shaded by a

beaver skin cowboy hat. He mines cobalt during the day and pans for gold in the evening. He'll go to World War II in less than a year.

My Grandmother sits in a faded recliner, covered by one of her handmade quilts. A torn cushion peeks from the armrest. She has been widowed once and divorced (from my grandfather) for as long as I have known her. Her hair is boy-cut short, with white-streaks falling from a head of ash. She wears nylon stretch pants, pink today, and always a blouse. I watch her mouth full of silver sparkle as she tells the story I like best.

My father sent me down alone to the river bottoms, late one November afternoon, it must have been 1929, to herd a few heifers back up to the small pasture for wintering. She thumbs through a stack of photos as she talks. *There it is, that's the pasture,* she says, handing the photo to me. The pasture is outlined by driftwood fence posts, probably carried by the river in late spring and gathered easily by her father in early summer, when runoff subsided and the gnarled logs lay in piles along the banks. The Bitterroots rise above a grove of aspen, the range of mountains that Lewis and Clark passed through, just north of Salmon. At the time, most of that country must have looked nearly the same as it had to the expedition. *I guess I was just eight or so, but I was doing good. I had them all rounded up and was headed to the pasture. Going to make it before supper. That's the first thing I always thought about. I was always hungry. But down in the valley, in those days, things could change in a hurry. Our oldest*

heifer up and took off into the trees—she just riled out of nowhere. But I found out why she spooked in a hurry.

She says that suddenly a heap of blackness rolls over the Bitterroots and mounds up in the valley. By the time she finds the heifer, hunkered in a grove of aspen, the world has turned to white, silencing all but the push of wind. *I could only see the black blotches of the heifer, the stubborn old thing, and I could pick out a few trees. Snow thickens with each gust. She remembers wondering how to get home, which direction to walk blindly. Then the old heifer began wandering and nearly dissolved into the storm before I caught up to her. I was lost, hungry, didn't know what to do. I lost all dad's cows, except one. I was in real trouble.*

Out of instinct she reaches to find the heifer's spine, and, with a mittened hand, traces the bony trail past the hip bones to the tail and slides it through her hand like a rope and holds—white knuckled—to the end. *The old heifer kept moving. I couldn't see anything. I kept my head down and stepped where she did. She seemed fine with me as stowaway. I squeezed that tail so tight. I'm lucky she didn't kick me.*

The two walk in tandem until the gravel road crackles familiar under the snow and the cabin's creosote stained walls appear through the backdrop of white. *The rest of the herd all made it back, and it was dark by the time I could tell where we were. I didn't tell nobody.*

This story gathers, with each telling, details of the last and the next, but always ends with a sense of longing, and always this: *I'd go back and live there, in a tent if I had to. I*

sometimes imagine what this wish might look like in reality: a wall tent with a sharp-pitched roof, the sun-baked canvas stained brown from rain sliding from the roof and gathering on the walls, where the dirt climbs. Inside, a few of her cheap, particle board bookshelves hold her collection of blue glass. Her recliner, with the torn cushion exposed, sits in the corner next to a pot-bellied stove, a metal-framed bed on the opposite wall. Her quilts. I don't know why she wants to live in a tent. But I understand her longing to return. I feel it, too, this ancestral pull to native land.

You can go back grandma. I've been there. Not much is there anymore, no house or anything, but it might be nice for you to see it. How long has it been? I say this without knowing that I have maybe said too much.

She stares at the wall. Isaac waddles in and jumps on her lap. *Oh, Isaac, I'll bet you want fed.*

I fed him for you, grandma.

Oh, did you dear? She strokes Isaac's head and looks him in the eyes.

I can take you back anytime you want to go. It's a wonderful trip across the desert, just four hour's drive.

It's probably all different now anyway, she says. I'm just an old fool.

You're no fool, I say as I always do, and I mean it as I always do. And I am prepared for the story that comes next.

Did you know I crawled on my hands and knees to Salmon because I think my back was broken? It goes that her friend was piloting a Ford Model A, late one autumn night, on

the road that parallels the Salmon river, *and she missed a hairpin, launched the old Ford right into the river.* My grandmother dragged her unconscious friend through the broken windshield and let the current wash them both down to a sand bar. She couldn't walk. So she crawled up the rip-rap bank and continued on to Salmon—two miles away—her friend beached and bleeding on the white sand. *I don't know how I made it. They say I saved her life. Eleanor Roosevelt sent me a personal letter—don't even know how she would have heard about it, but it must have been big news.* At this point in the story, she rises and goes to the hall closet and begins digging through the piles of handmade quilts. *I'll see if I can find it for you.* She never has found the letter.

She uncovers her cedar chest, chipped at the corners and worn smooth on the top, and rustles through mounds of yellowing letters, with return addresses dating back to the mid-1940s, from Germany and Japan—sent by Chester, a PFC in WWII. She stops suddenly when she gets near the bottom of the trunk, leans back on her heels, turns her head toward me, and reveals one of the letters. The letter is from Chester, not Eleanor Roosevelt.

A small photograph peeks from its open flap. The paper inside is crisp and white and clean, unlike the dozens of letters piled on the top. She traces the sharp corners with a finger, slides the photo out, and hands it to me. In it my grandmother sits on the steps of a stick-framed shack next to the Salmon River, little Chester Jr. on her lap. The bunchgrass and sage grow wild in the foreground. A thick clump of rabbit brush bulges from under the steps; junipers cast the long shadows of fall. Colonies of aspen and cottonwood, ponderosa and fir lace the river's edge, and the broad backs of the

Bitterroots sew together a steel-blue seam of sky. The little cabin has only two windows, both facing south. The tin roof is rusted. The lap-board exterior serves as sheathing, insulation, and siding. The shack stands as a collage of materials, some of it new, some of it reclaimed from the many abandoned mining settlements deserted in the 1920s. But it was all new to them.

Chester had worked where he could, in the cobalt mine or in the woods mostly. But he gladly signed up when the Civilian Conservation Corps came to enlist men to work on a major road building project that would connect Salmon, Idaho, with the rest of the world. By 1943, he was fighting in Europe. And as I run my finger across the photo, I look at my grandmother's dark hair, white house dress and black shoes, chubby-faced Chester Jr. squinting in the lemon rays. I know that the letter says to his young wife and sweet little boy that they are loved and cherished and missed, and that he hopes—he hopes to look into the Bitterroots and close his eyes and hold his son to his chest. The Salmon River will rinse the war from his memory. He'll hurry home, just as soon as he can, it says. I know without reading it, the final letter she would receive.

The next letter came in an official Army envelope. No postage or return address. *It was hand delivered by two men in uniform, she tells me. They must have come a long way to give me that letter.* I hand the photo back to her and she places it gently into the envelope and shakes her head, speaking softly to herself as she closes the lid. The smell of cedar lingers in the room.

She left the Salmon River just a year after Chester had been killed in the war. She married a pipefitter, my grandfather, who also worked in the cobalt mine, made more and more relevant in the burgeoning nuclear age in Idaho, and moved to the mining camp aptly named Cobalt. She was 21 when she left the one room home that overlooked the river. They emptied it of what little it contained: cast iron stove, washtub, feather bed. Then they left the little home to grow wild into the landscape. What was it to own a place in that part of world in the 40s? The land was nearly free and building materials were there for the taking. Folks settled then vanished. When my grandfather drove her down the length of the Salmon River to Challis, then on to the mining camp, she must have felt invigorated to start again, to vanish like everyone else had, to let in a new place, to forget about the contents of the letter brought by the uniformed men. She lacked the foresight to know that she would spend the rest of her life in a similar series of hopeful moves to disappointing places.

From my father we learned to be critical of her transitory lifestyle—to question why she is always on the move. He was the most rooted man I will ever know. My father used to walk into her houses and just shake his head. On the drive home, he'd say something like *most people who want a change buy furniture or landscape the yard, but my mother, no, my mother has to move 1,000 miles away so that she can fill the house with worthless crap, close the blinds, and hardly ever leave.*

I wonder what it is about a place that draws her to it, what hope she carries from one place to the next, and I also wonder what shift in the horoscope urges her to leave again. Each time she announces her next move, my father asks her to move home. But she has already made the decision before she calls to ask him to come help her.

She is living out her last days now, and nobody knows that more clearly than she does. She has not been home for half a century. Going back. Is there such a thing? On my more cynical days, I think she is just too stubborn to go, or too old and delusional—the easy explanations. She didn't even return home when the Forest Service sent notice that they were preparing to reclaim her family's homestead if back taxes weren't paid. She must have put the notice under a stack of Reader's Digests and suppressed the memory of ever having received it.

The Forest Service turned the land over to a saw mill. The mill only lasted for a few years, but the property is still managed by the Forest Service. The landscape has recovered remarkably well. I have noticed small vestiges of details gleaned from her photos and stories, but it's not the same place. Her memories are the only remnants of that time, a vision of life rooted not by place, but through story. Near the end of too many years of rootless living, memories orbit her brain and urge her withered frame to go home. But, I suppose, another set of memories lie at the outer edge of her conscious reality, a knowledge of the here and now that will unravel what she tells herself about the landscape of her youth.

Years ago, when I visit her place on the Salmon River (or what's left of it), I walk to the river's edge and lean on a ponderosa's trunk. The river churns in a back eddy before emptying in little riffles that eventually turn to glass when it meets the white sand. And I try to listen for what my grandmother heard when she listened to the river, what she would have me know about the river's ritual pull. What percentage of my grandmother's life was spent aimlessly wandering, only to end up where memories begin, and where they must end?

Now I leave her unsettled house, her final house, knowing full well that it could be the last time I see her alive.

You are beautiful, I say, wrapping my arms around her. She giggles. And I laugh, too, because it's the part of the visit I like best. Then I leave her to her memories.

As I drive home, I see my grandmother sitting on her old couch, searching the faces of young, familiar strangers, living among her fluid recursions of memory. I replay the image of her as a little girl, wandering the river bottoms in search of a cow, as she yearns to inhabit that innocent girl's world—spun golden through memory—to reach blindly across eighty-seven years to find the smooth spine of an old heifer, trace the bone past its sharp hips, clutch tightly to its tail, guiding her path back home.

A Nuclear Inheritance

The Atomic Energy Commission's fatality estimates considered the radiation dose to the downwind population only in the first twenty-four hours after the accident. In fact, radioactive cesium (Ce-137) contained in the fallout ... the substance that would be the principal source of the injury to the public ... has a half-life of thirty years, and for decades to come would expose the population over an area too wide to be excavated to its harmful effects. The most serious injuries would be latent forms of cancer that would not show up until years after the accident.

—Daniel Ford, *The Cult of The Atom*

I know well the impulse that urges one home. It is the pureness of the urge that saves me from nihilism—to return home. The barest of dreams are held in the nuclear landscape of my youth. They are inspiring and terrifying at once and the blood in my veins. But from my attachment to this landscape I have learned about the compatibility of nihilism and hope. Just as John Rember observes, “Lots of contradictory concepts, once they're embodied in the physical world, exist quite happily together, sometimes in the same object” (64). Over time I have come to understand this place for what it is and isn't, what it represents and what it might become.

Returning home, I drive the two-lane highway across the Lost River Desert toward the Big Southern Butte. I am perhaps thinking of allegory more than story as I

turn off Idaho's Highway 26 to the unmarked ruts that meander through the basalt and sage and carve a path to the butte. I am thinking of Robert Bly's poem "A Home in Dark Glass" as the ancient volcano becomes smaller as I near it:

We did not come to remain whole.

We came to lose our leaves like the trees

The trees that are broken

And start again, drawing up from the great roots.

The Big Southern Butte is the Lost River Desert's "great root." I return not to remain whole, but to remain fractured by the dark history of this great desert and what it represents to my family—at once a source of sustenance and deprivation. And I come back not in spite of but because of.

The cheat grass is still tender and lush, and the snow still hides the outcrops on the south facing slopes. I am early this year. I first began making the 2,000-foot nearly vertical climb to the top during my undergrad years at nearby Idaho State, when I began perceiving something ominous happening in the desert. It was a way to gain perspective, for the top affords an expansive view from Salmon to Blackfoot and beyond, a view of the only world my father ever knew. From the top I try to come up with the words.

In the beginning the ritual was mostly a way to literally gain perspective and to learn more about the lay of the land, to know it as intimately as my father had. In his absence, I needed an image, to see as far as I could in every direction. In the beginning I

had hoped to see further, something beyond the familiarity of open space and the outline of mountains in every direction.

In the years since, the image continues to evolve. I began searching the image with a series of vague and yet haunting questions about my father's death—had he been exposed to radiation and did that exposure result in his early death?

As I make my way up the impassible jeep trail, which switch backs for a time before fading to a series of broken ruts and game trails, I know that I have lost some of the zeal accompanying that early search for answers. What I wanted then was revenge. Today I am not out for revenge, or redemption, or reconciliation. The lack of these motives strikes me, suddenly, and then a connecting thought disrupts my concentration and I feel the loose earth shift beneath my boot: what good have I done with the countless hours spent reading declassified government documents and environmental reports? I had started with the idea of being the Erin Brockovich of the Lost River Desert – bringing down the Atomic Energy Commission and making them pay for my father's death.

But as I tried (and continue to try) to fit words to that story, I realize that it's the same story told by all the downwinders, the military men used as dummies, the countless and faceless atomic victims, the depraved guinea pigs who welcomed the nuclear age to their cherished landscapes. The place and the people and the circumstances are different, of course, but I know now that there is no bringing down the Atomic Energy Commission or the Department of Energy or any other culpable bureaucracy—not out here in the Idaho desert.

Snow and ice replace the mud and rocks and the ascent has slowed considerably. I stop for a moment, pluck a sprig of sage and hold it to my nose, feeling the afternoon sun warming my back. So now what, I think, turning my gaze to the summit? But as I begin the climb again, I confront maybe a more difficult question. What have I gained from the process of searching?

It arrives as an uneasy question that I have been unwilling to face simply because knowing the answer might mean losing what has connected me to my father for the past few years. These are the only new memories I carry. And then I think again of Bly's first line—*We did not come to remain whole*. I started this project with the idea of discovery—that something missing from my family's story might be made whole and right. Like so many others who might tell their atomic stories of uncertain causation, I discovered that my father's cancer will never be linked directly to the radiation he was exposed to during his short forty-two years lived on the edge of a nuclear testing site.

I had hoped to write another story, one of discovery and wholeness. And as I make the summit of the Big Southern Butte, Experimental Breeder Reactor One comes into view, and I can all but see the forty acres that hold my father's childhood home, just ten miles west as the crow flies. Beyond that, past Idaho's highest peak, Mt. Borah, and Mackay, I can make out the outline of the familiar mountains near Cobalt. Turning to the east, across the hundred-mile Lost River Desert, the miles and miles of dormant potato fields, winding through the basalt beds, the prelude to my childhood home. The nuclear labs dot the sea of desert to the north. From up here, a clear day affords a panorama of the least understood nuclear landscapes in America, but this view also

frames the only places my father called home and the only place I will ever call home—my nuclear inheritance.

I walk to the edge and feel the dizzying height and the cool wind. I notice for the first time the butte's similarity in shape to the Tower of a Thousand Cranes (on a much greater and natural scale), a monument built in honor of the thousands of school children killed when Little Boy leveled Hiroshima. The monument was constructed in specific honor of Sadoka Sasaki, a fourteen-year-old girl dying from radiation sickness in 1955 and her classmates who took up the tradition of folding 1,000 paper cranes, a tradition that would bring good luck in Japanese lore. The base of the tower bears the inscription: "This is our cry. This is our prayer. For building Peace in this world."

What began as discovery has turned to revelation.

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