

LETTER FROM COLORADO

THE URANIUM WIDOWS

Why would a community want to return to milling a radioactive element?

BY PETER HESSLER

There are many uranium widows in southwestern Colorado, and some of them keep radioactive rocks around the house, but probably only one has a photograph of her younger self drilling for ore in sandals, denim shorts, and a bra. Her name is Pat Mann, and she is eighty-one years old. "You'll have to accuse my attire," she said with a laugh, as she handed me

in the remote town of Paradox. Around here, place names have the ring of parables: Calamity Mesa, Disappointment Creek, Starvation Point. The local history of uranium is long and often troubled, and the economy has been devastated since the Three Mile Island accident, in 1979, when Americans turned against nuclear power. Many old-time Colorado miners suffer

to block the project, which would also lead to renewed mining, and they've expressed frustration with signs of growing national openness toward nuclear power. American nuclear plants still produce twenty per cent of the nation's electricity, but a new reactor hasn't been licensed since 1996, and eighty-six per cent of the uranium used for fuel is imported. Domestic mining and milling have been erratic since the mid-nineties, when the Megatons to Megawatts program, which converts warheads from the former Soviet Union into fuel, was initiated. But that program is set to expire in 2013, and the prospect of climate change has led to the reevaluation of a power source that combines high yield with low carbon emissions. In February, President Obama ap-



Uravan was where the Manhattan Project milled uranium ore for the bomb. An epidemic of cancer among the miners was first documented

the photo. Mann explained that she dressed like that on hot days in the nineteen-fifties, when she worked on her first husband's mining crew. "People say, 'That uranium will kill you!' Well, we'd drill into those veins and blow it up, and it'd be all over." I asked her about plans to build a mill nearby that would process uranium to be used for nuclear power generation. "I know we got a bunch of tree huggers and grass eaters," Mann said. "They seem to be against the mill. Most of them haven't lived with this stuff. I lived with it, and it hasn't bothered me."

Mann resides in a double-wide trailer

from lung disease, and one former mill community, Uravan, was deemed so radioactive that everything in town—houses, streets, even the trees—had to be shredded and buried. And yet since 2007, when a company called Energy Fuels arrived with plans to build America's first new uranium mill in almost thirty years, the response in the Paradox region has been overwhelmingly positive.

For outsiders, this reaction is puzzling. "Why would somebody want to go into something that killed people in horrible ways?" one newcomer asked. Environmental organizations have filed lawsuits

proved more than eight billion dollars in conditional loan guarantees for the construction of new reactors. In former industry centers like southwestern Colorado, old debates have been rekindled. Some say that local cancer rates are the highest in the state; others say that this area is among Colorado's healthiest. Natives told me that former mill sites are harmless, whereas environmentalists suggested rolling up the windows and driving by fast. I have yet to meet a uranium widow who opposes the industry that killed her husband.

Pat Mann has outlived two of them.

REPORTAGE BY GETTY IMAGES

30 THE NEW YORKER, SEPTEMBER 13, 2010

The last one, George, died of lung cancer in 2000. "A lot of miners died from cancer, but they smoked," she said. "George was a heavy smoker." In her back-yard rock collection, Mann picked up a stone with bright-yellow streaks. She said that she didn't believe uranium really causes cancer. She had big hands, with a mangled finger that had been surgically reattached years ago after it was crushed by a fifty-five-gallon oil drum. She put the uranium down, wiped her hands on her pants, and gave me a good firm shake before I left.

Colorado's atomic history is full of contradictions, beginning with the fact that the first large-scale mill that processed radioactive elements was built in the hope of curing cancer. Around the



in 1956. Photograph by Benjamin Lowy.

turn of the twentieth century, when Marie and Pierre Curie began pioneering research on radioactivity, they worked primarily with radium. Soon, it was being used in experimental treatments of cancerous tumors, a forerunner of radiation therapy. In the early nineteen-hundreds, a Pittsburgh industrialist named Joseph M. Flannery lost his sister to cancer, and he blamed her death on a lack of radium. He responded with a tycoon's act of grief: in 1912, his company, Standard Chemical, built a mill to process ore less than ten miles from Paradox Valley.

Radium is exceedingly rare and highly

radioactive. It's a decay product of uranium, and it gives off radon gas; its peak price, in 1919, was more than three million dollars an ounce—at the time, the world's most expensive substance. Once, Marie Curie travelled all the way from France to the United States to receive a gram of Colorado-mined radium. But its value turned out to be fleeting; eventually it was replaced by more effective substances for radiation therapy and other applications. Coloradans switched to producing vanadium, another element found in local rocks, which can be used to harden steel. The old Standard Chemical mill was acquired and converted by Union Carbide, which built a town around the site.

The company called the place Uravan, in honor of local elements. It was another parable of a name, although in the beginning they had no idea of the value of what they were sitting on. Until the nineteen-forties, uranium had few commercial applications, and vanadium mills discarded the element in their tailings. During the Second World War, atomic-bomb scientists realized that those Colorado waste piles might help end the conflict. In 1943, the Manhattan Project built a new mill in Uravan, processing vanadium tailings into uranium oxide, or yellowcake. The yellowcake was sent to plants in other parts of the country, where it was enriched into bomb material, along with uranium from the Belgian Congo.

All of this was done in strict secrecy. The word "uranium" was banned from official reports, and workers didn't realize that they were contributing to the atomic bomb, at least until the attacks on Hiroshima and Nagasaki. ("It kind of leaked out after that," one elderly local told me in a slow drawl.) After the war, when the nuclear arms race heated up, the government encouraged private citizens to explore and drill for uranium. Federal agencies built backcountry roads, and the Atomic Energy Commission established guaranteed prices for ore. It became the only government-sponsored mineral rush in American history—approximately nine hundred mines were opened across the Colorado Plateau. In a region of tough names, these were the dreamers: the King Solomon, the Silver Bell.

There was essentially no regulation. Most mines lacked proper ventilation, and in the nineteen-fifties public-health officials discovered that radon concentra-

THE NEW YORKER CURRENTS



Watch a video
of Richard Cook,
the architect of the new
Bank of America Tower,
and Paul Goldberger,
The New Yorker's
architecture critic,
talking about sustainable
design and the built
environment.

Go to
newyorker.com/go/currents
to view this event.

Supported by



Let's build a smarter planet.

NEWYORKER.COM

THE NEW YORKER, SEPTEMBER 13, 2010

31

tions were nearly a thousand times higher than the accepted level of safety. Miners liked their cigarettes underground, where radioactive particles attached to the smoke and were drawn deep into the lungs. Meanwhile, Uravan's population grew to more than eight hundred, with its mill situated in the center of town. One native told me that as a boy he descended into a uranium mine and ate lunch with his father on Bring Your Son to Work Day. In the nuclear cycle, a major risk of public contamination is mishandled mill tailings, which contain radium and other radon emitters. In Uravan, the sandy tailings served as bedding for construction projects. People laid water lines in the stuff. Gardeners used it to loosen up the clay soil. Old mill equipment, much of it contaminated, was tossed openly onto a hill above town; kids and scavengers liked the dump so much that they called it Treasure Island.

When a remote community suffers a health crisis, it's as if a curtain separates residents from the outside world. Typically, locals are frustrated that others fail to comprehend their pain, but the reaction in the uranium towns is the opposite. "He didn't take it real personal," Gayland Thompson told me when we discussed his father, a miner who died of lung cancer. "He wanted to work there." Like other people from the Uravan region, Gayland complained that protesters from elsewhere speak in the town's name, exaggerating health problems. From the locals' perspective, the curtain that separates them from the world also serves as a screen, allowing others to project their own image of what happened in this distant place.

And yet nobody denies that many miners died from small-cell lung cancer. The epidemic was first documented in 1956, when government health officials had an autopsy performed on Tom Van Arsdale, a fifty-one-year-old miner. Experts recommended that mines improve ventilation and institute other safety features. But a culture of secrecy remained from the war years, and agencies avoided acting on the reports. In Colorado, stricter regulations weren't instituted for more than a decade, and it took even longer for victims and their families to receive substantial restitution. In the nineteen-seventies, this battle was taken up by Stewart Udall,

the Secretary of the Interior under Kennedy and Johnson. Udall represented, among others, families of Navajo Indians who died after mining in terrible conditions in New Mexico; in Udall's words, the government "had needlessly sacrificed the lives of [the Navajo miners] in the name of national security." In 1990, Congress finally passed the Radiation Exposure Compensation Act, which provides health care and cash payments of a hundred and fifty thousand dollars and more to miners and other uranium workers who become ill.

In the town of Naturita, I met Marie Templeton, a local historian and the daughter of Tom Van Arsdale. Templeton's husband also died of small-cell lung cancer, but she refused to see the men as victims. She told me that they had chosen a high-risk occupation that paid well, and they noticed health problems among colleagues long before the story broke. "It was an accepted risk," she said, "because they were earning a good living for their families." She told me that she had kept a "nice piece of ore" in her house for forty years.

Even sick miners spoke in the same way. Billy Clark, who has pulmonary fibrosis, told me that he'd be glad to see the industry return, because now it's better regulated. But he shook his head when I asked about his old co-workers. "Most of them goddam gone," he said. "The ones that are around, they're worse than me. They're on oxygen."

His wife, Debbie, spoke up. "My uncle passed away last year," she said. "His lungs just crystallized and he was spitting up this bloody stuff. They told us it was parts of his lungs."

Billy uses oxygen only at night. This seems to be a point of pride among former miners, who rely on their tanks as little as possible. They often note that breathing in is easy—breathing out is the hard part. This distinction seems important to them, as if it might cut any unwanted sympathy by half. People often live in a house or a trailer that was bought with a government settlement. Pat Mann put a new roof on her home after her husband died; Billy Clark's double-wide was paid for with what his wife jokingly refers to as "blood money." People commonly express gratitude for Union Carbide.

"The way I look at it, I wanted a job," Larry Cooper, a former Uravan miner now in his eighties, told me. "They gave

me a job. I didn't ask if I was going to get cancer—which I did. It was just one of those things. I think our life wasn't too bad, don't you, Mom?"

"Not at all," his wife, Avis, said. She was knitting an afghan with the colors of the American flag. Every time Larry breathed out, he hissed and pursed his lips, which gave him a thoughtful expression. He told me that half of his right lung had been removed. "But I smoked probably sixty years," he said. "So I won't say that the cancer was caused by Carbide."

It's never a good sign when a community posts a "For Sale" notice in front of its elementary school, as the town of Nucla, which is about fifteen miles from the proposed mill site, did last year. The surrounding region once had a population of between six and eight thousand; now there are only about sixteen hundred people. Many locals work construction or cleaning jobs in Telluride, the prosperous ski community that is about sixty-five miles from the proposed site of the Paradox mill.

Much of the opposition to the mill has come from Telluride. The Sheep Mountain Alliance, an environmentalist group, has filed a lawsuit to halt the project, but activists acknowledge that it's hard to oppose development when you come from a thriving town. "I recognize how patriarchal that can seem," Hilary White, the director of the Sheep Mountain Alliance, told me. She believes that economic problems have made people receptive to the uranium industry, which she doesn't think can be trusted to follow regulations. "When you're desperate, when you can't afford to put food on your table, you'll welcome people who don't have your best interests at heart."

The local relationship with history can seem particularly baffling. At a public meeting in the county seat of Montrose, the actress Daryl Hannah spoke out against the mill; she owns a home between Telluride and Paradox. "It's kind of mind-boggling for me to hear people say, 'I worked at the Uravan mill, and it was a booming economy at the time, and I wish we could go back to it,'" Hannah told a reporter. "But you look at Uravan now and it's completely fenced off, and it says, 'Radioactive, Do Not Enter, Dangerous, Use Caution!'"

Uravan thrived through the nineteen-

sixties and seventies, when the American uranium industry shifted from defense to energy production. But in the nineteen-eighties the town laid off workers, and after Three Mile Island there was increased public concern about radioactive sites. The State of Colorado successfully sued Union Carbide, forcing a Superfund cleanup so extensive that it required the town's destruction. All remaining residents were moved out—the last to go was the postmistress—and on New Year's Eve of 1986 Uravan was officially closed.

For the next two decades, Union Carbide, which was acquired by Dow Chemical in 2001, worked in conjunction with the federal government in trying to remove virtually all traces of radioactive contamination from the site. A crew of as many as a hundred workers demolished the mill, the school, the houses—a total of two hundred and sixty structures. After the buildings and the roads were gone, the cleanup proceeded into the soil, like an archeology of the atomic age. Workers found a vial that was believed to have contained radium, once the world's most expensive substance; now they buried it in one of four repositories atop a neighboring mesa. A section of State Highway 141 passed over the site of the Manhattan Project's uranium mill, so they tore up the road and replaced it. They excavated the foundation of the first radium mill, the one intended to cure cancer, and they destroyed that, too.

Regulations specified that everything be shredded and buried. Uravan contained some working bulldozers, dump trucks, and Caterpillar loaders; all were ripped apart with hydraulic shears. Store-rooms of unopened supplies—sinks, toilets, test tubes, whatever—were torn to bits. One worker told me he shredded a brand-new stainless-steel rod worth at least five thousand dollars. They ripped up water lines; they uprooted gardens; they tore down every tree in town. Whenever equipment left the site, it was washed and checked with a Geiger counter. If a bulldozer blade or a hydraulic shear couldn't be cleaned to strictly low radiation levels, it was destroyed on the spot. Sometimes tires had to be removed and shredded.

To design the repositories, computers simulated the worst storm that was likely to occur in the next thousand years. The Uravan site is now fenced in, with warn-

ing signs that read, "Any Area or Container on This Property May Contain Radioactive Materials." Soon, it will become the property of the Department of Energy, which intends to keep it closed for all eternity. The destruction of Uravan has cost more than a hundred and twenty-seven million dollars, of which about fifty million came from federal funds. On the other side of the world, Hiroshima and Nagasaki are revived cities, but the town that helped make the bomb has been wiped completely off the face of the earth.

Today, nobody lives within nine miles of the site, which is a narrow plain pressed between two cliffs of sandstone. Each summer, former Uravan residents hold a reunion picnic nearby, and occasionally people stop by on their own, as if it were a cemetery. Whenever I accompanied visitors, there was a strange conjunction of radioactive warnings and nostalgia: people leaned over the fence and pointed out where they had been married, and where children had been born, and where teen-age indiscretions had been committed. "I kissed a boy on the bridge on Halloween!" a woman in her fifties said, giggling. "That was the original tailings pile," a man said fondly, pointing at an empty space beside a cliff. "We'd take old car hoods and slide down it."

In a region of tough people, this obscure and ruined spot sometimes seemed the sole point of sentimentality. Twice, former residents wept while talking about Uravan, which never happened during a discussion of a family death from cancer. It was partly a perception of agency: locals found dignity in mining and milling, whereas nobody had had a choice in leaving Uravan. But there was also a strong sense of injustice and waste. People loved the town, and they perceived the cleanup as unnecessary; they hated the way outsiders assumed that Uravan natives suffered birth defects and other health problems. "U₃O₈, when it's first mined, it's not that hot," Gene Greenwood, a former Uravan resident who had helped supervise the cleanup, told me, using the chemical abbreviation for yellowcake. He noted that people tend to conflate different forms of uranium—yellowcake, enriched fuel, and bomb material—when in fact each has a markedly different production process and radioactivity level. He said the Uravan cleanup hadn't been motivated by

Advertisement

ON THE TOWN

BE THE FIRST TO HEAR ABOUT EVENTS, PROMOTIONS, AND SPECIAL OFFERS FROM NEW YORKER ADVERTISERS.

**FASHION'S
NIGHT
OUT
SEPT. 10
2010
NYC**

Join Banana Republic for a celebration of style, co-hosted by *The New Yorker*, and view an exclusive exhibition of fashion covers from *The New Yorker's* 85-year archive.

From 6 P.M. to 7 P.M., meet the magazine's art editor, Françoise Mouly, and Banana Republic's creative director, Simon Kneen. Plus, enjoy sparkling wine, hors d'œuvres, and 25% off full-priced purchases all night long.

One night only, and only at **Banana Republic Rockefeller Center.**

Attendees must be 21 to consume alcohol.

BANANA REPUBLIC

newyorkeronthetown.com

THE NEW YORKER, SEPTEMBER 13, 2010

33

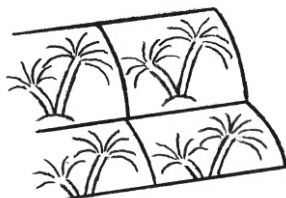
health concerns, and now the site is no more radioactive than the surrounding landscape. "It was a liability issue," he said. "It wasn't a safety issue."

The locals often speak of uranium in highly technical terms. They refer to "thermoluminescent dosimeters," and they distinguish between alpha and gamma radiation. The sudden sophistication can be jarring; once, a woman compared President Obama to Adolf Hitler and then mentioned the results of an epidemiological study on the effects of ionizing radiation. Few people have much formal education, but anything atomic seems familiar to natives, who often say surprising things. They insisted that unenriched uranium isn't carcinogenic, and they said there's no evidence that the low radiation levels involved in regulated mining and milling have negative health effects. Howard Stephens, who had worked in the Uravan mill, told me that the radiation levels he received there were about the same as those of someone employed in New York's Grand Central Terminal. People said that the airline industry exposes employees to more radiation than the nuclear industry does. Ron Henderson, a county commissioner, told me that yellowcake is so harmless that it can be mailed in the U.S. postal system. "It's like sending powdered sugar," he said. "You put it in a Ziploc. You just want to make sure you zip it all the way across."

The contrast with the environmentalists who opposed the mill couldn't have been greater. They were better educated and more worldly, and their opinions weren't influenced by the prospect of financial gain. But I noticed a vagueness with regard to scientific issues. "There's always been a lot of talk of leukemia and cancer rates around these places," Travis Stills, a lawyer who is involved with two of the anti-mill lawsuits, told me. When I asked about evidence, he said that epidemiological studies were unreliable. Activists often quoted a statement issued by the Larimer County Medical Society in Fort Collins, Colorado, which claimed that communities engaged in uranium mining have suffered a "documented increase" in leukemia, childhood bone cancer, miscarriages, genetic abnormalities, and other serious conditions. But when I contacted the physicians who issued the statement they couldn't produce a source.

And yet almost everything I heard in the uranium towns could be documented. The World Health Organization does not classify uranium as a human carcinogen. The walls of Grand Central Terminal are made of granite, which contains elements that produce radon; a worker there receives a larger dose of radiation than the Nuclear Regulatory Commission allows a uranium mill to emit to a next-door neighbor. Being closer to the sun—living in the mountains, flying in planes—also means more radiation. According to the National Council on Radiation Protection and Measurements, the average airline crew member receives an annual dose of work-related radiation that is more than one and a half times higher than that of the average employee in the nuclear-power industry. (Neither dose is higher than what the typical American receives from natural background radiation.) And there is no compelling evidence that low amounts of radiation cause health problems. Finally, I wondered if even the craziest things I'd heard were true, and I called the regional spokesman for the Postal Service. He told me in no uncertain terms that yellowcake is classified as a UN 2912 radioactive material, and that it is strictly forbidden in the mail, regardless of whether I zip the bag all the way across.

Uravan has been studied by Dr. John Boice, who founded the radiation-epidemiology branch of the National Cancer Institute. He now teaches at Vanderbilt School of Medicine, and is also the scientific director of the International Epidemiological Institute, an independent research organization. When I met him at his office in Rockville, Maryland, he told me that Uravan, like many company towns, had unusually good records. Accessing data from 1936 to 2004, Boice and others traced mortality for a wide range of diseases for the entire population. "We did find a significant increase of lung cancer," he said. "But in men only. It was concentrated in the underground miners.



There was nothing with the women who lived in town. If you're looking at an environmental exposure, you'd expect men and women to be the same. And even the millers did not show this."

The over-all Uravan mortality rate was ten per cent lower than the national average. There was less heart disease, which probably reflected the life style of well-employed people who liked outdoor activities. Boice had conducted other studies in uranium regions, and the only significant risks he had found involved miners who labored in unventilated conditions, especially those who smoked. He noted that safety measures have made an enormous difference. "The radon levels are so low now," he said. "In the early days, they had no standards."

Activists told me that Boice's Uravan study was unreliable, because it had received funding from Union Carbide. When I had the material reviewed by independent experts, they said the methodology was sound, and the findings were in line with those of the National Institute for Occupational Safety and Health, which has found no statistically significant evidence that mill workers suffer higher mortality rates because of either the radiation or the chemical toxicity of uranium. In New Mexico, where the DINEH Project is studying Navajo communities, some with a history of unregulated mining, researchers told me that they believe there is an association with kidney disease and other ailments, but they cautioned that the findings are still preliminary.

Scientists said that, despite the public perception, radiation is a weak carcinogen. Dr. Ethel S. Gilbert, who served as a committee member for the National Academies' report on radiation health risks, explained that people often fail to distinguish between high and low doses. "They think that if you get exposed it's bad," she said. "It's hard to understand that the dose is important." Gilbert described what researchers know about an exposure of 0.1 sieverts, which is more than fifty times the average annual dose of an American nuclear-power employee. From the industry perspective, such a dose is high, but not in terms of health effects. "Out of one hundred people exposed to 0.1 sieverts, we would expect one cancer from that exposure," Gilbert said. "But there would also be forty-two people who would get cancer for other reasons.

THE REAL THING

It was interesting to be thinking of something.
 It was interesting to be thinking. To be thinking. To. It was interesting.
 It was then she heard the voice the one inside the voice the one she heard.
 It was then. Was it a poor imitation or was it the real McCoy. Was it.
 Did she know. Was she thinking. Was it an interesting imitation
 or was it pure fakery. Fakery of the purest kind. The crocodile
 was surely faking it.
 She was sure of it and she was sure. She crossed the bridge into Connecticut
 thinking that crocodile tears were the new thing. The It thing.
 Imposture. Word of the year was it now that she had established it.
 She had certainly established. People were establishing were in fact
 established.
 She had dialled it in she had their number. Their time was up the McCoys.
 She was sure of it. She had. She had dialled the McCoys. The McCoys.

—Rachel Galvin

It's very hard to study these low levels, because there are so many other things that contribute to people getting cancer."

The effects of high doses are well documented, largely because of a sixty-year study of nearly a hundred thousand Japanese atomic-bomb survivors. With high levels of radiation, there's a clear linear pattern—more exposure means an incremental rise in risk. But it's unclear whether this pattern continues into the lower-dose range, where any health effects are so small that they can't be demonstrated by epidemiological studies. Some experts and scientific bodies, including the French Academy of Sciences, have questioned the linear model for low levels, believing that radiation may be harmless up to a certain threshold. This is a controversial idea, because it would radically change risk assessment, as well as possible solutions for the storage of nuclear waste.

United States regulations continue to follow the linear no-threshold theory. It has the benefit of being simple and safe, but it can also be misinterpreted. Because of Colorado's elevation, a resident there receives two to three times the natural background radiation of someone who lives in New Jersey, so strictly speaking there should be an increased risk of cancer. (In fact, Colorado cancer rates are lower.) After the Chernobyl accident, in 1986, anti-nuclear groups and scientists used the findings from the Japanese atomic-bomb survivors, extrapolated downward for the radiation levels in Eu-

rope, and predicted tens of thousands of deaths from cancer. Critics note that this is like taking a set of deaths from motorists who drove a curve at a hundred miles an hour and making the assumption that, if people slow to ten miles an hour, they'll die at a tenth of the original rate. This is also why a hundred and twenty-seven million dollars was spent obsessively cleaning up an abandoned town whose former residents lived longer than the national average. Metaphorically speaking, the Uravan speed limit was set at zero.

Even worst-case disasters reveal surprisingly small effects. In Chernobyl, dozens of emergency workers died after fighting the reactor fire, but the health impact on neighboring communities seems to be limited. After more than twenty years of extensive study, there is no consistent evidence of increased birth defects, leukemia, or most other radiation-related diseases. The only public epidemic consists of high rates of thyroid cancer in children, whose glands are particularly sensitive to radiation. Fewer than ten people have died—thyroid cancer is usually treatable—although it will be years before the full impact of the epidemic is known. But, like the accident itself, it could have been avoided entirely. The Soviet reactor lacked a containment facility, and the Communist government delayed announcing the accident. "The Russians could have done one thing that would have gotten rid of the epidemic of thyroid cancer," Boice told me. "They could have

said, 'Don't drink the milk.'" In surrounding areas, cows ate grass contaminated by fallout, and people fed the milk to their children. An open society probably would have responded differently; even as far back as 1957, when a fire at a badly designed British nuclear facility called Windscale released radiation, all local milk was dumped into the sea.

Boice told me that the biggest health problems from high-profile accidents are often psychological. A twenty-year study showed no consistent evidence that the low amounts of radioactivity released in the Three Mile Island accident have had a significant impact on mortality in communities around the reactor. But people suffered from high rates of stress and increased alcohol consumption. Places near Chernobyl have high rates of alcoholism, tobacco use, and depression. After the Ukrainian accident, European countries as distant as Greece reported a significant spike in elective abortions, owing to a fear of birth defects. Because of Chernobyl, a number of European nations scaled back dramatically on nuclear power, and Italy closed down all its reactors. Twenty years later, the country purchases electricity from France, which is eighty per cent nuclear, and now the Italians have decided to build new reactors of their own.

None of the cancer specialists I spoke with opposed nuclear power for health reasons. Invariably, their biggest worry was the storage of reactor waste, although many people note that this problem is more political than scientific. Several scientists told me that there should be greater public concern about medical radiation, because high-dose procedures like CT scans can be overprescribed, and regulation is light in comparison with the nuclear power industry. (From 1996 to 2006, the number of CT scans performed in the United States increased nearly threefold.)

Boice expressed concerns about terrorism, but largely because he believes people are seriously misinformed about radiation. Converting yellowcake or even enriched reactor fuel into an effective bomb is complex and probably impossible for a terrorist group, but that's not the issue. Even materials with low levels of radioactivity—for example, the kind of stuff you find in living rooms in southwestern Colorado—would terrify most people. "We've studied radiation for

one hundred years," Boice told me. "We know a lot about it. But it's invisible. A colleague said, 'If you could paint it blue and see it, it wouldn't be such an issue.'"

While most grass-roots environmentalists remain anti-nuclear, the evidence of climate change has led some prominent greens to become vocal supporters. Patrick Moore, one of the founders of Greenpeace, left the organization, and believes that it takes an unscientific view of the issue, and the Gaia theorist James Lovelock is a particularly outspoken advocate. Last year, Mark Udall, the Democratic senator from Colorado, addressed the issue on the Senate floor. "For some," he began, "news that a Udall is speaking favorably about nuclear power will come as a stark—and perhaps unpleasant—surprise." Udall comes from a prominent family of environmentalists, and his uncle, Stewart Udall, who died last year, represented the Navajo uranium miners in their lawsuit. Senator Udall told me that he deeply respects his uncle's legacy, but that current regulations are much improved and the threat of climate change requires new thinking. "The risks that are attendant to the use of nuclear power are worth embracing," he said. "Just like the risks that come with increasing the use of natural gas or, frankly, even renewables."

Udall prefers wind and solar energy, but he acknowledged that they aren't capable of significantly displacing coal in the near future. He believes there are solutions to the issue of nuclear-waste storage. When I mentioned the proposed uranium mill in his home state, he said, "I can support such a project if all the requisite laws and regulations are met." He emphasized that past problems had been caused by a Cold War mentality. "We were driven into a mind-set that we have to be secretive here, we don't need any regulations or controls."

I asked whether fear of climate change, like the old fear of the Soviets, might lead to rash decisions and carelessness. "Given the difficulty that we face right now in Washington in convincing a supermajority in the Senate that we have to respond to climate change," Udall said, "I'm not as worried about that. But I think it behooves us to never forget these lessons."

There's a timeless quality to the far corner of Colorado, which is too remote for national chains, and where travellers stay at the Ray Motel, in Naturita. The Ray still uses keys, and the key chain still has a nineteen-seventies-era message promising that if it's dropped into any U.S. mailbox it will be returned free of charge. In January, when I checked in, a receptionist named Sherri Ross asked if

I had arrived for the public hearing on the Energy Fuels mill. Ross explained that she was a former Uravan resident whose father and several uncles had all died from mining-related lung cancer. By now, this information was sufficient for me to guess that she was a wholehearted supporter of the industry. "We've had the biggest loss you can ever have, and we're not against the mill," she said. A cleaning lady walked past and commented that lung cancer had also killed her father, and she sure hoped the mining would come back.

The Colorado Department of Public Health and Environment was holding the hearing in Nucla. Most people predicted that the Health Department would eventually grant approval, but lawsuits were still pending. The real issue, though, seemed to be financial. Energy Fuels is listed on the Toronto Stock Exchange, and the share price had plummeted in the past year. Despite signs of a nuclear resurgence, especially in India and China, where large numbers of reactors are planned, the United States' path remains unclear.

George Glasier, the founder and C.E.O. of Energy Fuels, told me that he was confident there would be demand. He had worked as a lawyer for uranium companies until the crash in the nineteen-eighties, when he bought a ranch in southwestern Colorado. Like many industry executives, he was savvy about riding the economic waves. He had opened a gravel pit on his property, selling rock for use in covering the remains of Uravan. He had also sold a hundred thousand cubic yards of topsoil that was poured onto another contaminated mill site. Now that the industry seemed ready to shift from obsessive cleanup to real production, Glasier hoped to get back in business. He still kept a chunk of ore and a jar of yellowcake in his home. "That's fairly high-grade," he said, handing me the rock. I didn't open the jar.

For branding purposes, Energy Fuels had named its project the Piñon Ridge Mill. "We didn't want to have the word 'paradox' in there," Glasier said. He produced a promotional display from the Nuclear Energy Institute: a plastic pellet that, had it been real enriched uranium, would have the generating capacity of a ton of coal. The display said "Nuclear. Clean Air Energy." It dated to the nineteen-seventies, when people worried about



"Well, by that logic no one would ever shave a clock onto a monkey."

smog instead of climate change; the font was as old-school as the Ray Motel's key chain. "I'd give it to you, but I don't have any more left," Glasier said.

Public hearings have been held throughout southwestern Colorado, where there's no telling what will be said when an open mike is offered. Once, a speaker reminisced about how great the tomatoes tasted in radioactive Uravan, and then he was followed by a man who announced, apropos of nothing, "I'm not really into a black guy for President." Environmentalists said they often felt uncomfortable at such meetings, where locals sometimes express anger toward opponents. I sympathized with the outsider perspective—as a writer, I often inspired the same response—but I came to understand the reason for this anger. Natives were accustomed to condescension, especially with regard to health issues, when in fact their specialized knowledge ran deep. I took many local opinions with a grain of salt, but I listened when people talked about uranium.

At the Nucla meeting, more than two hundred citizens attended, and the vast majority wore orange buttons that said "Yes to Mill." "We're not afraid of uranium here," Joyce Shaffer, a former Uravan resident, said into the microphone. "I don't like skiing. I'm afraid of it. I don't understand it. But I understand uranium, and I'm not afraid of it." Another woman explained that she had lost family members to the nuclear industry. "I have no regrets for that," she said. A member of the Chamber of Commerce made a statement that could come only from a region called Paradox: "Uranium and tourism can coexist."

It wasn't until the thirtieth speaker that somebody opposed the project. In the end, only five spoke out against it: they referred to health risks, wildlife issues, and the storage of nuclear waste. Craig Pirazzi, a Paradox resident, criticized the industry's volatility. "These are not stable jobs," he said. "These people deserve better than this."

Every August, Uravan natives return for their picnic. With the site fenced off, they congregate on the former baseball diamond, which is about a mile to the southeast. The dugouts are long gone, and tufts of switch grass have overrun the base paths, but there was never a cleanup

here—no wire fence, no warning signs. The site is pleasantly shaded by big cottonwoods that escaped destruction.

At this year's picnic, George Glasier told me that he was happy to be ranching full time. In the spring, he had stepped down as the C.E.O. of Energy Fuels, announcing that the company needed new direction. Initially, the stock price dropped to twelve cents before rebounding a bit. Most people believe that the company hopes to get licensing approval and then sell out to a big corporation that can weather the uncertainty. It's another timeless quality in the uranium towns: they might be thirty years too late, but it's also possible that they're ten years too early.

More than two hundred people came to this year's picnic. They travelled from as far away as Houston and Los Angeles, and a couple of Navajo families drove up from New Mexico. Two former Uravan doctors showed up, and the high-school class of 1969 held its fortieth reunion. Many people wore T-shirts that read, "DANGER: Radioactive Material: I Lived in Uravan, Colorado!" An organization called Professional Case Management distributed information about government assistance for former uranium workers.

At the base of one cottonwood, people arranged old metal street signs from Uravan: Flint Avenue, Mill Drive, Calcite Avenue. They were supposed to have been shredded along with everything else, but workers had sneaked them out. A man named Stan Cadman, who had grown up in town, brought an enormous "Uravan" sign that once marked the highway turnoff. Cadman now drives a trucking route through southwestern Colorado, and often, in the middle of the night, he pulls over where his home town once stood.

"It's haunted up there," he told me. "You can hear voices." I thought about everything that might haunt such a place—mill sounds, coughing old miners, maybe even Japanese targets of the bomb—and I asked Cadman what he heard. He was a big man with a Harley-Davidson cap, tattooed forearms, and a biker's beard. He smiled and said, "You can hear kids playing." ♦

NEWYORKER.COM/VIDEO

Peter Hessler gives a tour of Uravan.

Advertisement



Just added!

Justin Timberlake joins Jesse Eisenberg and Aaron Sorkin in the conversation following the screening of "The Social Network."

Friday, October 1st, at 6 P.M.
Directors Guild Theatre (\$30)

David Neville and **Marcus Wainwright**, of rag & bone, join the Fashion Forward panel.

Saturday, October 2nd, at 1 P.M.
SVA Theatre 1 (\$30)

Cynthia Nixon joins the Case for Gay Marriage panel.

Saturday, October 2nd, at 4 P.M.
SVA Theatre 1 (\$30)

Program update:

Wendell Pierce is no longer able to take part in the conversation between David Simon and Margaret Talbot.

Saturday, October 2nd, at 4 P.M.
Acura at SIR Stage37 (\$30)

ILLUSTRATION BY TOM BACHTELL