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42. PMC, Reel II, 465-67.
43. CIR, Box 5, Folder: "Company Towns," Charles Witesman, 11 August 1914.
44. PMC, Reel II, 91-93, 453-54.
45. PMC, Reel II, 22-25, 64-65, 91-93, 236-52, 453-54, 487-88.
46. PMC, Reel II, 239-40, 246-49.
47. PMC, Reel II, 246-49.
48. PMC, Reel II, 236.
49. PMC, Reel II, 248-49.
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51. PMC, Reel II, 106.
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Mining the Atom: The Cold War Comes to the Colorado Plateau, 1948-1958

KEVIN J. FERNLUND

In the 1948 issue of *Mining Year Book*, a trade journal published by the Colorado Mining Association, the editor opened with a glowing retrospective of the industry. The piece entitled, "Westward Ho," recounted in a triumphant narrative a century of mining history, from the California Gold Rush to the establishment of the western steel industry. On this occasion, the association also declared that the "Western movement" was far from over, but wistfully acknowledged that the roughing it days of the early prospectors had long since passed.¹

That same year the Atomic Energy Commission (AEC) announced in a series of circulars that it would purchase—at a ten year guaranteed minimum price—the uranium content of carnotite and roscoelite ores from the Colorado Plateau. Prior to these public notices, miners received only 35 cents a pound for uranium; after they got \$3.50.² Coming on the eve of the mining industry's second century in the West, this news seemed auspicious indeed. For if anything represented the future, it was uranium. In the years following World War Two, the atom's promise as a new frontier of opportunity beckoned, just as the lure of other frontiers had before.³ And with a collective memory that tended to recall the political and financial rewards of past expansions, rather than the societal and environmental costs, the nation entered the Atomic Age with little to guide it except a deeply held belief in progress.

Caught up in the optimism of the times, the U.S. Bureau of Mines reported that, "By the end of 1946 there were some predictions that commercial electric power from atomic prime movers was only about 5

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years away."⁴ Besides looking ahead to a world run on this new energy, the bureau speculated about the potential of the atom in fields as diverse as science, industry, agriculture, and medicine. Thus, the prospects of atomic energy benefiting humankind appeared very promising in the postwar years. Anxieties over national security and the steady deterioration of the relationship between the United States and the Soviet Union, however, suggested a very different future for nuclear power.⁵ The AEC's decision to create a domestic uranium industry was but a case in point in this dramatic turn of events.

John K. Gustafson, director of the AEC's raw materials office, recognized the need to develop the nation's uranium resources. He noted in April 1948 that the nation imported more than three-fourths of its ores from the Shinkolobwe mine in the Belgian Congo (Zaire).⁶ In the event of another world war, even the uranium mines in Canada, which were another important source of supply for the United States, were deemed too faraway. Given the relatively low price of uranium on the global market, the ten-year domestic plan that Gustafson developed clearly made much more strategic than economic sense. Whatever the motive, the director's plan to achieve a degree of self-sufficiency in what might turn out to be the raw material of the next millennium was greeted enthusiastically by the mining interests of the Four Corners area of Utah, Colorado, Arizona, and New Mexico, although one of their chief congressional spokesmen, Senator Edwin Johnson of Colorado, was soon complaining about the government's "pinch-penny" prices for uranium.⁷

Long before the start of the Cold War, Southwesterners had mined uranium at various sites on the 100,000 square miles of the Colorado Plateau—a land, or rather barrier, situated behind another barrier, the Rocky Mountains, both of which had divided the torrent of America's westward expansion like two great boulders in the middle of a stream. From the standpoint of development, the Plateau, which remained difficult to negotiate well into this century, had at least one redeeming feature: its mineral secrets were relatively easy to uncover. For the geology of this massive, but deeply eroded, block of uplifted earth was clearly exposed, or rather, illustrated in a spectacular display of colors, ranging from dark chocolate browns to luminous whites, including the bright canary yellow of carnotite, a complex mineral compound containing radium, vanadium, and uranium.⁸

As early as 1871, miners of the Colorado Plateau shipped limited quantities of uranium to Europe. Uranium salts and oxides were used in several manufacturing processes, but uranium was chiefly valued as a colorant. Not until 1896 did scientists discover that uranium emanated invisible rays. Two years later, Pierre and Marie Curie learned how to separate radium, another radioactive element, from uranium pitchblend, which was mined in Bohemia.⁹

While uranium excited scientific curiosity for decades to come, radium, which was believed to hold the cure to cancer and other ailments, became the object of wide interest and great demand. When uranium carnotite was found to contain radium, the hunt for the rare white metal was extended to the Colorado Plateau. In the early 1920s, however, the rich Katanga mines in the Belgian Congo went into operation, a development that quickly killed the American West's radium industry. Foreign competition, in this case coming from Peru, also stifled the vanadium industry, although only temporarily. By the mid-1930s, domestic suppliers, backed by the Reconstruction Finance Corporation, the Bureau of Mines, and the United States Geological Survey, benefited from a new demand for this steel-hardening agent. Orders increased soon thereafter when the United States military armed itself in the fight against the Axis powers.¹⁰

The war dramatically accelerated the production of many of the West's minerals, such as copper, lead, chrome, zinc, molybdenum, manganese, and mercury. Uranium was also on the list of strategic minerals. Not until after the war, however, did the public learn that uranium was a key material in the Manhattan Project, a two billion dollar atomic research and weapons production complex under the direction of Major General Leslie R. Groves, United States Army Corps of Engineers.¹¹

Significant amounts of uranium were known to exist in the tailings left over from the operations of two of the Colorado Plateau's major vanadium producers—Vanadium Corporation of America as well as U.S. Vanadium Corporation and Union Mines Development Corporation, both of which were subsidiaries of Union Carbide and Carbon Corporation. Lieutenant Philip C. Leahy, stationed in Grand Junction, Colorado, was one of the officers assigned the job of recovering as much "green sludge" as possible from these tailings. Leahy could not have performed this task without the advice of local mining experts such as Blair Burwell, who had previous experience in the radium and vanadium industries.¹²

The secret work of the Manhattan Project, which had centered around the activities of a brilliant group of European and American scientists at Los Alamos, New Mexico, led to the detonation of an atomic device on 16 July 1945. By 6 August, an American B-29 dropped this revolutionary weapon on the Japanese city of Hiroshima; three days later Nagasaki met with the same fate. These attacks instantly killed over 180,000 civilians; thousands more died in the aftermath. This awesome demonstration of power and loss of life surprised Japan, despite President Harry S Truman's warnings, and convinced the war-torn, but defiant, empire to accept the Allied terms of surrender.¹³

One of the effects of keeping the development of the atomic bomb a closely guarded secret was the tremendous strengthening of authority in the United States, be it governmental, military, or scientific. For in

"harnessing the basic power of the universe," as Truman put it, to bring a long and costly war to a close, the nation's leaders had proven almost Olympian in ability and sense of purpose.¹⁴ Nowhere would this new and unhealthy trust of power become more evident than in the American West.

During the ensuing Cold War, westerners accepted virtually without question the need for a military-industrial complex, which, in no small part, had already been built-up in the war against Germany and Japan.¹⁵ With all of its many bases, command centers, proving grounds, training schools, nuclear test sites, bombing ranges, missile fields, arsenals, laboratories, weapons plants, naval yards, and strategic mining sites, the West became, in effect, the front line in the forty-year stand-off between the United States and Soviet Union. As a result of this extensive military activity, the lands of the American West, in relation to the rest of the country, bore a disproportionate environmental impact. The pollution and cleanup problems at Rocky Flats Weapons Plant outside Denver, Colorado, or at the atomic reactors and plutonium plants in the Richland-Hanford area of Washington, are but two examples of the environmental damage that will be problematic for decades, perhaps centuries.¹⁶

Of course, a commitment of this magnitude was not made in a regional vacuum. National fears of internal betrayal and preoccupations with international crises disturbed the American West as much as any other part of the country. These anxieties were especially acute during the tense and uncertain time between Gustafson's announcement of the AEC's uranium procurement plan in 1948 and President Dwight D. Eisenhower's initiation of the Atoms for Peace program and his signing of the Atomic Energy Act of 1954, in which private industry and other countries were invited to participate in the peaceful development of nuclear power.¹⁷

At the start of this difficult period, the United States began testing a new generation of atomic weapons during exercises code named Operation Sandstone. These tests were conducted on the faraway Eniwetok Atoll, in the Marshall Islands. The United States then took the far-reaching step of reactivating the Selective Service System. On the other side of the world, Communists staged a coup in Czechoslovakia and imposed a blockade on West Berlin, which Truman countered with a ten-month airlift of supplies. The next year the North Atlantic Treaty Organization was established, tying America's defenses to Western Europe's, a move the Soviet Union countered by detonating its own atomic device a few months later. Then, Communists seized power in one of America's old missionary fields—China. With these developments in Asia, the struggle against communism became global.

To regain the military and political advantage in this potentially dangerous struggle, Truman escalated the arms race on 31 January 1950 by ordering the development of a hydrogen bomb. This decision was followed by a momentous shift in American foreign policy. In April, the United States assumed the burden of defending the free world. Like the Republican Party of the 1850s, which opposed the extension of slavery to the western territories, the National Security Council urged a halt to the further spread of Communism. This new policy of containment was tested two months later when North Korea invaded South Korea. True to its word, the United States entered the war under the auspices of the United Nations. In October 1950, the AEC initiated an ambitious expansion program that enlarged and strengthened each link in the production chain, from the procurement of uranium to the preparation, manufacture, and final use of fissionable materials.¹⁸

At the same time America was making these global commitments, fears of subversion mounted at home. In this regard, various events included the revival of the House Un-American Activities Committee, the trials of Alger Hiss, the growing use of red-baiting in politics, Truman's federal loyalty program, the passage of the McCarran Internal Security Act, blacklisting, the Klaus Fuchs-Rosenberg case, and the intimidations of Joseph McCarthy. As Eisenhower stated in November 1952, approximately a year after the explosion of the first thermonuclear device, "Actually we see threats coming from all angles, internal and external, and we wonder what is going to happen to us individually and as a nation."¹⁹ Out West these anxieties were just as pronounced. The residents of Denver, Colorado, for instance, were subjected to mock air raids and detailed speculations about how much damage a hydrogen bomb would do to their city, while not far from Las Vegas, Nevada, real atomic bombs were being tested in the desert.²⁰

The Cold War would continue—with varying degrees of intensity—until the fall of the Berlin Wall in 1989. The 1950s, however, were an especially insecure time.²¹ As early as 1953, J. Robert Oppenheimer wrote that in terms of the respective size of the nuclear arsenals of the United States and the Soviet Union, the superpowers were like "two scorpions in a bottle, each capable of killing the other, but only at the risk of his own life."²² Learning to live in a stalemate that grew ever more deadly would be the challenge facing policy-makers and statesmen over the next thirty-six years.

Great power rivalry was hardly new. The historic antagonism between the French and the English comes to mind, as do the heroic struggles of the Greeks and Trojans. What clearly set the Cold War apart from these and other conflicts was that this new set of belligerents had the power to destroy themselves, and much of the civilized world, in a single battle. The bomb, of course, changed everything. And at the front

of the nuclear production line stood the determined uranium prospector, dressed in sweat-stained khaki, wearing a knapsack, and sporting a Geiger counter. At first glance, this figure appeared to have more in common with Death Valley Scotty than a soldier in the industrial army of the United States national security state.

It is true that prospectors, no less than other westerners, were driven by motives other than loyalty, patriotism, and sacrifice. By maintaining a vast military-industrial complex, the West won various economic benefits—from high-paying jobs to improvements in infrastructure.²³ Certainly good citizenship was not the overriding concern of the thousands of uranium prospectors who came to the Colorado Plateau. Contained in the opening paragraph of a popular prospecting handbook, for instance, was the alluring idea that:

Uranium prospecting offers one of the greatest opportunities of modern times to “strike it rich” without major investment of capital, time, or knowledge. . . . All over the country, “weekend prospectors” are hunting uranium. The strikes that have already been made prove that even the novice can prospect for uranium without excessive expense and training.²⁴

These prospectors—weekend types or fulltimers—mainly sought, like the Forty-Niners a hundred years before, to find their fortune and realize, out there among the radioactive outcroppings of the Colorado Plateau, the American Dream.

The Forty-Niners and their latter-day counterparts also had something else in common: they were both actors in the great national dramas of their day. The gold nuggets that the prospectors discovered in the stream beds of California seemed to vindicate the sacrifices of the Mexican War, and prove that there was more to the idea of Manifest Destiny than political rhetoric. By the same token, the uncovering of significant deposits of uranium on the Colorado Plateau during the worst years of the Cold War suggested once more that America was blessed with the “right” resources at the right time.²⁵

On a more secular level, the uranium “rush” or “boom” of the 1950s was portrayed as yet one more exciting episode in the go-for-broke history of the American West. From this perspective, the uranium prospector differed little from other western resource finders or users who became heroes, such as the fur trapper, Forty-Niner, or cowboy. In a sense, viewing the activities that occurred on the Colorado Plateau at mid-century in terms of the Old West provided the nation with a familiar, if mythic, counterpoint to the frightening realities of a world on the brink of nuclear devastation. Along these same lines, trying to satisfy

the psychological need for reassurance at such an insecure time might also be one explanation why Americans were enthralled with Western novels, movies, and television shows.²⁶

There will always be something compelling about individuals physically wrestling the earth for its riches, despite the environmental wreckage mining left behind—from hydraulic-blasted hillsides in California to radioactive uranium tailings on Colorado’s Western Slope. Not surprisingly, the heroic story of the human struggle with nature has been the subject of the West’s best writers. In the classic travel guide, *Roughing It* (1872), for example, Mark Twain captured the colorful and expectant, if hard and gritty, life of the frontier miner with wit and telling detail.²⁷

In *Desert Solitaire* (1968), Edward Abbey, who bemoaned the ruthless development of Arches National Monument and the loss of wilderness, found the uranium prospector an irresistible figure. Here, after all, was the common man in a great western setting battling against huge odds—a rough and unforgiving country, the superior resources and advantages of big mining companies, swindlers, and numerous safety hazards. Seduced by the western myth of the rugged individualist, however, Abbey failed to recognize that the uranium rush accomplished at least as much as “industrial tourism,” his *bete noire*, in bringing “syphilization” to the Colorado Plateau.²⁸

In the realm of film, the uranium prospector was a real-life western figure who literally shared the same stage with the western heroes of the imagination. For example, renowned Western film director, John Ford, often used Monument Valley, situated in the heart of uranium country, as his main outdoor set. While Ford was out among the spectacular red buttes and mesas filming such classics as *Fort Apache* (1948), *She Wore a Yellow Ribbon* (1949), *Rio Grande* (1950), and *The Searchers* (1956), miners busily worked the same area, extracting a new kind of lead, for a new kind of bullet, to be used in a new kind of gun, in what might turn out to be the last of the great showdowns.²⁹

The moral clarity of the Western actually complemented the black and white ideology of the Cold War. At times, the dividing line between “savagery and civilization” on which many a Western plot depended seemed to run right through the national security apparatus. The Central Intelligence Agency certainly saw the world as an intense battle ground between Communism and Democracy, that is, between the black and white hats. Such comparisons can be easily overdrawn, and the complexity and ever-changing nature of popular culture in postwar America all but precluded the reduction of art into government propaganda. Yet, even in the best artistic examples of the Western genre, films like George Steven’s *Shane* (1952) and Ford’s *The Searchers* (1956), the message was clear to an audience raised on Hitler and Tojo: World War Two might

be over but civilization still had to be ready to fight violence with violence. Clearly Cold War America needed Shane's fast-draw, backed up by Ethan Edward's tenacity and grim determination.³⁰

Off screen, the country also required the real skills and talents of a famous frontier type—the bewhiskered prospector. Jesse C. Johnson, one of Gustafson's successors at the AEC's Division of Raw Materials, expressed it this way in 1950:

I am convinced that the prospector, like the infantryman, is not outmoded. We still need the prospector to find mineral deposits. The geologist's technical knowledge is no substitute for the optimism and persistence of the prospector.³¹

According to the Colorado Mining Association, "The greatest asset that America possesses, as well as the only real atomic secret, is the ability and ingenuity of the American citizen in rising to an emergency and performing the task at hand."³² These sentiments were shared in *True West* magazine. In an article entitled "Uranium: 1956," the author declared: "Uranium hunting is a job that has to be done individually; it's a job cut out for the small-time shoestring operator, for the amateur prospector who's got the guts to buck the long odds with his last few bucks. Uranium is the one last treasure in the earth that's left for the little guy."³³ Here was a chance to get a piece of the frontier before it was too late.

Nearly ten thousand prospectors took advantage of this great opportunity, some of whom were professional hard-rock miners displaced by the idled lead and zinc industry. On the whole, however, they came from many different walks of life—grocers, dentists, repairmen, and school teachers. But not everyone came from distant parts. Mormons, Navajos, and other locals were also swept up in the mining "frenzy." In contrast to the footloose stereotype of the prospector, an indefinite number of these fortune-seekers were married. And despite the excitement, they and their families sought some semblance of domestic order in the dusty trailer parks that sprang up everywhere.³⁴

The most famous uranium prospector was Charles Austin Steen, popularly known as "the Cisco Kid." This hard-headed, down-on-his-luck, and out-of-money geologist from Texas staked a dozen claims, one of which he named *Mi Vida* ("My Life") on the Lisbon Anticline in eastern Utah. Typical of other prospectors, Steen lived with his wife and four toddlers in a tiny trailer adjoined to an eight by sixteen foot shack in Yellow Cat Wash, near the little town of Cisco. By 1952, after years of doggedly overcoming one setback after another, Steen discovered a bonanza of high-grade uranium ore (uraninite) worth millions. Moreover, Steen succeeded in turning this find into a personal fortune. News of his strike inspired hundreds of would-be nabobs to try their

luck in the field; others stayed closer to home and traded in uranium penny stocks. Not everyone became rich in the uranium rush, and an unfortunate and undetermined number who were overexposed to radiation while mining ore eventually lost their lives.³⁵

In spite of the prominent role the independent prospector played in the uranium rush of the 1950s, it would be wrong to interpret this event as yet another grand exercise in rugged American individualism, because at every turn Uncle Sam was there with a guiding hand. Indeed, the success of the boom depended as much on "socialism" as entrepreneurial capitalism—a curious amalgamation that was peculiarly American.

As *Fortune* magazine observed, this event was "the first government-promoted, government-supported, and government-controlled mineral rush in American history."³⁶ In addition to providing financial incentives to prospect and mine, the government allocated funds for the construction and maintenance of ore-buying stations, for the building of hundreds of miles of access roads, and for an ambitious exploration program that included such innovative techniques as airborne reconnaissance, carried out on planes equipped with scintillation counters.³⁷ Besides the exploratory activities of the AEC, the United States Geological Survey (USGS) also made an important contribution in helping prospectors locate uranium.

The USGS, unlike the AEC, enjoyed a long history on the Colorado Plateau that dated back to the 1870s. After the interruption of World War Two, the federal agency resumed its historic role, compiling a detailed inventory of the nation's mineral resources that resulted in the publication of thousands of reports and maps. Nevertheless, for obvious reasons uranium was of special interest. With financial support from the AEC, the USGS undertook a host of exploratory projects, ranging from diamond drilling to plant distribution studies in search of the radioactive metal.³⁸

In 1958, the Atomic Energy Commission's ore-buying program achieved its goal of creating a native supply of uranium, and the miners found themselves victims of their own success. The uranium industry, for example, produced from 60 to 76 million tons of ore in that year alone. Initially, most of the mines were located on the western slope in the Uravan mineral belt. By 1954, however, hundreds of producing claims were located throughout the Southwest in Utah, Arizona, and New Mexico, and on the northern Great Plains in Wyoming and South Dakota. Given this large and rapidly growing supply, the AEC decided on 24 November 1958, to limit further purchases of ore to only those reserves already under contract, an act which marked the end of a mining boom.³⁹

The uranium industry nonetheless remained optimistic. By the end of 1958, there were five civilian power reactors in operation, suggesting that in the near future private demand would supplant the government's guaranteed market.⁴⁰ Moreover, the International Atomic Energy Agency considered the atom a boon, rather than a curse. Founded 1 October 1957, this agency enjoyed a membership of sixty-five countries. Similarly dedicated organizations included the Inter-American Nuclear Energy Commission of the Organization of American States (OAS) and the European Atomic Energy Community (Euratom).

Within the context of the Cold War, the uranium prospector served the country's interests and greatly contributed to a thriving peacetime nuclear industry. Eventually, though, a host of problems engulfed the nuclear power industry, such as poor reactor designs, high costs, construction delays, safety concerns, and waste disposal. The turning point came in 1979 with the partial meltdown of the reactor core at Three Mile Island. Whatever hope remained that the industry's reputation and sense of promise would recover were dashed seven years later by the disaster at Chernobyl. In a strange way, it was this failed attempt to use atoms peacefully, rather than being exhausted by maintaining a nuclear defense, that helped undermine the Communist Party's authority to govern effectively, thereby hastening the end of the Cold War.⁴¹

The Colorado Mining Association was right in 1948. The "Western movement" was not over. Clearly, the uranium rush shared a number of the classic characteristics—both good and bad—of previous mining rushes. But this was only one, and perhaps the least significant, part of the story of uranium mining and prospectors. In the larger picture of the Cold War, this colorful episode was one among many that ultimately led to the victory of the United States over its great Communist adversary.

NOTES

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Plateau (Denver, Colorado: Bell Press, 1956); see also Lisa Pitcher Godfrey, "Mining the Colorado Plateau: The Story of Calamity Mesa, 1910–1970," (Master's thesis, Utah State University, 1991) and Duane A. Smith, *Mining America: The Industry and the Environment, 1800–1980* (Lawrence: University Press of Kansas, 1987).

4. *Mineral Yearbook, 1946*, 1218.

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7. *Rocky Mountain News*, 18 July 1949, 5.

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9. *Engineering and Mining Journal* 71 (4 May 1901): 564; Robert Reid, *Marie Curie* (New York: Saturday Review Press, 1974), 78–89; D. B. Hammond, *Stories of Scientific Discovery* (Freeport, New York: Books for Libraries Press, 1969), 126–30.

10. See Shumway, "History of the Uranium Industry"; Don Sorensen, "Wonder Mineral: Utah's Uranium," *Utah Historical Quarterly* 31 (Summer 1963): 280–290; Michael B. Husband, "'History's Greatest Metal Hunt': The Uranium Boom on the Colorado Plateau," *Journal of the West* 21 (October 1982): 17–23.

11. Gerald D. Nash, *World War II and the West: Reshaping the Economy* (Lincoln: University of Nebraska Press, 1990), 18–40; *Rocky Mountain News*, 11 August 1946, 24; *Denver Post*, 7 August 1945, 1. See Richard G. Hewlett and Oscar E. Anderson, Jr., *A History of the Atomic Energy Commission, vol. 1, The New World, 1939–1946* (Berkeley: University of California Press, 1990); Ferenc Morton Szasz, *The Day the Sun Rose Twice: The Story of the Trinity Site Nuclear Explosion, July 16, 1945* (Albuquerque: University of New Mexico Press, 1984).

12. William L. Chenoweth, "Grand Junction and the Uranium Boom, accession no. 1992.59;" Philip C. Leahy to William L. Chenoweth, 15 December 1986, accession no. 1992.59, William L. Chenoweth Collection, Museum of Western Colorado. See also Hewlett and Anderson, *The New World*, 65; Ringholz, *Uranium Frenzy*, 27–28; *Mining Year Book, 1951*, 41–43; *Denver Post*, 23 May 1968, 51.

13. David McCullough, *Truman* (New York: Simon & Schuster, 1992), 435–47.

14. *Santa Fe New Mexican*, 6 August 1945, 1.

15. See Gerald D. Nash, *The American West Transformed: The Impact of the Second World War* (Bloomington: Indiana University Press, 1985) and *World War II and the West*; Mark Foster, *Henry J. Kaiser: Builder in the Modern American West* (Austin: University of Texas Press, 1989).

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17. Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Villard Books, 1993); *Eighteenth Semiannual Report of the Atomic Energy Commission, July 1955*, 1–4; Stephen E. Ambrose, *Eisenhower*, vol. 2, *The President* (New York: Simon & Schuster, 1984), 131–53.

18. Alice Buck, *A History of the Atomic Energy Commission* (Washington, D.C.: U.S. Department of Energy, August 1982), 2.

19. Quoted from the film, *The Atomic Cafe* (1982).

20. *Denver Post*, 23 March 1954, 6. The first atomic tests to occur in the West after the Trinity Site detonation were held in January 1951 at a bombing and gunnery range outside Las Vegas. Buck, *A History of the Atomic Energy Commission*, 2.

21. See H. W. Brands, "The Age of Vulnerability: Eisenhower and the National Insecurity State," *American Historical Review* 94 (October 1989): 963-89.
22. J. Robert Oppenheimer, "Atomic Weapons and American Policy," *Foreign Affairs* 31 (July 1953): 529.
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27. Mark Twain, *Roughing It* (1872; reprint ed., Alexandria, Virginia: Time-Life Books, 1982).
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Mining New Mexico: A Photographic Essay

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In January 1965, at the request of New Mexico's senior U.S. Senator, Clinton P. Anderson, chairman of the Senate Committee on Interior and Insular Affairs, Congress published a report titled: *Mineral and Water Resources of New Mexico*. This comprehensive, mid-century evaluation of the state's mineral industry ranked New Mexico seventh among all the states in annual production of mineral resources, and first among the states of the Rocky Mountain region. According to the report, the southwestern state contributed 3.6 percent of the total domestic minerals produced in the United States. At the time of the publication, New Mexico's mineral industry ranked first among the nation's producers of uranium and potash, third in copper, and sixth in oil and natural gas. The report estimated the value of mineral resources produced since 1861, when commercial mining began, at \$9.1 billion. Significantly, out of that total all but \$26.7 million was produced during the twentieth century.¹

While it is evident that most of New Mexico's mining productivity occurred since 1900, interest in the mineral industry began several centuries earlier. During the Spanish colonial occupation, which officially dates to the arrival in 1598 of Juan de Oñate and hundreds of trail-weary colonists, *nuevo mexicanos* mined salt deposits in the Estancia Valley. Freighters carried their cargo to the silver mines in Parral, Mexico,

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