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WORKERS AND SAFETY IN SOUTHERN NEW MEXICO MINING

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On 30 June 1998, Reynaldo Delgado and the rest of the crew at the smelting plant in Hurley, New Mexico, were shorthanded and pushing to make up production after a ten-day shutdown. At first everything was running smoothly: the molten ore inside the smelter was separating into copper and slag (impurities in the ore), and the slag was passing down into a large ladle below to be discarded. Then, however, the mud gun that normally closed up the full ladle failed, and the slag began to overflow. Delgado's bosses ordered him to remove the ladle manually, despite the molten slag now pouring over the ladle's brim. Delgado entered the smelter's tunnel, and then hesitated. Over his radio, he asked to be excused from what he knew to be a dangerous task, but his supervisor insisted that he continue. Delgado stumbled back out of the tunnel moments later covered in third-degree burns. As his coworkers poured water over his body, he asked, "Why did they send me in there? I told them I couldn't do it. They made me do it anyway." He died in agony three weeks later at a Tucson burn center, leaving a widow and two little girls.[1]

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Delgado's death was grisly, but it was hardly unprecedented. Mining and milling have always been dangerous occupations, and even today, stories like this or of miners trapped or killed underground attract international interest.[2]

New Mexico's economy has traditionally relied on the state's natural resources: empty spaces that can be used for military testing, vast tracts suitable for ranchland, breathtaking landscapes that attract tourists, and the extractive industries. Oil and natural gas, coal and copper, and uranium and potash have all brought tangible benefits, sometimes at the expense of individual workers' health and safety. Over the course of the last century, in return for regular wages and benefits, New Mexico miners have assumed substantial risks. Until production in New Mexico's coal mines declined in the mid-twentieth century, explosions in mines wiped out hundreds of lives.[3] The story of Navajo uranium miners of northwestern New Mexico who were exposed to life-shortening radiation and found their communities despoiled by the mining process is still unfolding.[4] Even in mines that are supposed to be safer or cleaner—lead, copper, zinc, and potash, classified as the "metal and nonmetal mines"—workers have faced dangers in the workplace and obstacles to effective government response.

Despite living in a western state where unions have been traditionally controversial, metal and nonmetal miners collectively were in favor of agitating for safety regulations after World War II. Organized through a national union in the 1930s and 1940s, their actions over the course of the next sixty years helped shift the power dynamic when it came to dealing with workplace accidents. In the 1940s, the New Mexico mine inspectorate was committed to promoting economic development, which meant that accidents were seen as unavoidable or caused by worker negligence. By the 1960s, after several high-profile accidents, the inspectorate became more sensitive to worker concerns, although it was still closely allied with the mining companies.[5] Given the chronic underfunding of New Mexico's mine inspectorate, miners thought federal safety rules and oversight of mine safety were crucial. Throughout the 1960s, New Mexico workers at the grassroots level used their power to achieve these goals.

While the workers at both the copper mines of Grant County and the potash mines of Carlsbad unionized around the same time, those in the copper mines had more long-term success changing safety regulations and policy. Over time, deaths in the copper mines decreased while those in the potash mines increased. Worker self-advocacy seemed tied to the nature of particular mined commodities and the culture of specific firms. A number of factors contributed to this discrepancy. Carlsbad potash mineworkers typically lived in the city of Carlsbad, allowing for a greater number of social ties

and concerns outside the mines. Grant County miners, on the other hand, tended to live on land owned by the copper companies, which created more solidarity of purpose among the workers there. Pushed together by cultural unity and adversity, Mexican American workers of Grant County's copper mines advocated for themselves more skillfully than did workers in the Anglo-dominated Carlsbad potash mines. Until the potash companies in the Carlsbad basin were acquired by Canadian companies, foreign competition made them operate on a knife-edge of profitability, limiting the extent to which Carlsbad miners could effectively achieve workplace reforms. Finally, the Grant County copper industry developed at the turn of the twentieth century, when labor paternalism was popular, while the potash industry of Carlsbad was founded in the 1930s, when paternalism was no longer the fashion. The different dates of origination could explain the contrasting levels of success in changing the attitudes toward worker safety. In the 1950s, Kennecott Copper, one of the largest companies in the Grant County area and inheritor of copper companies that had utilized a paternalistic approach, for example, initiated an innovative worker-safety program that helped lower both mine fatalities and accidents that kept employees from missing work.[6]

Copper Paternalism and Boomtown Potash

The copper and zinc mines of Grant County and the potash mines of Carlsbad developed in different eras and through different processes. Since the first decade of the twentieth century, workers commercially cultivated the copper mines initiated by Native Americans centuries before, and paternalistic employers dominated these isolated mining camps. At Tyrone in Grant County and at Dawson in northeastern New Mexico, for example, the Phelps Dodge Corporation built schools, hospitals, community centers, and mercantile stores for its workforce. In response to events like the Bisbee deportation in 1917 and the Red Scare of 1919–21, Phelps Dodge promoted Americanization and citizenship classes. The company encouraged workers to pursue "clean recreation" through sports teams and clubs, and it provided swimming pools, gyms, theaters, and golf courses.[7] Paternalism, however, came at some cost to workers: Phelps Dodge imposed a dual-wage system that discriminated against Mexican immigrants.[8] The company also curtailed free speech, inhibited unionization, and, by extension, restricted the freedom to advocate for safer workplaces. Although the coal mine explosion in Dawson, New Mexico, in 1913—one of the worst in U.S. history with a total of 263 lives claimed—would have been avoided if there had been sufficient ventilation, Phelps Dodge blamed the incident on an illegal dynamite charge fired by a

miner underground.[9] This response is indicative of the overarching attitude in mining industries on both the state and national levels at the time.

While paternalism and the promotion of company values receded in the 1930s and 1940s, they did not disappear completely. The companies that eventually were acquired by Kennecott Copper retained, through several name changes, company housing, a company store in Santa Rita, and the provision of leisure activities. Segregation of the workforce also continued. White workers in Hurley and Santa Rita were offered use of the Chino club, with "a snack bar and recreation room, a card room, a reading room with current popular magazines and a rather extensive library, bowling alleys, tennis courts, outdoor basketball court, handball court and space for roller skating." In contrast, Mexican American workers had only the "Casino," with a snack bar, a room with a television set and three pool tables, and restrooms.[10]

The institutionalized division of space for workers' leisure activities reflected other, equally unpalatable modes of discrimination. Grant County mining companies segregated their workforces through control of entry into certain job categories. Higher-paying jobs considered "skilled"—driving vehicles, operating machinery, working in the shops, and managing others—were off limits to workers of Mexican ancestry. Housing segregation was also widespread. Kennecott Copper and its antecedent companies maintained two types of company housing. Sturdy, multiroom "American" housing rented for between eight dollars and twenty-two dollars a month. For "Spanish-American" housing, however, workers paid a nominal fee for ground rent plus a monthly fee for electricity. These tenants also were required to construct their own cabins out of scavenged materials. Single, male, Spanish-speaking workers might also live in a "Mexican bunkhouse," a group dormitory.[11] Participants in the Empire Zinc strike in Bayard, New Mexico (1950–52), documented in the movie *Salt of the Earth* (1954), remembered separate and unequal facilities as one of the factors that motivated their discontent.[12]

Like copper, potash played a key role in the mid-twentieth-century New Mexico economy. New Mexico's potash deposits were accidentally discovered by oil drillers in the late 1920s, and the U.S. Potash Company started its first potash mine near Carlsbad in 1929 on leased federal land.[13] The Potash Company of America entered the field in 1933, and the International Minerals and Chemical Corporation in 1936.

These potash companies did not subscribe to the labor paternalism that defined the mining companies of Grant County, providing their workforces with few benefits. Carlsbad mines—like some mining companies in Grant County—used a dual-wage, low-paid labor system but, in their case, tried to keep Mexican American workers off their payrolls altogether. U.S. Potash initially

paid some workers only fifteen to twenty cents per hour.[14] "We wanted to be over the minimum and yet on the other hand we had to respect the local feeling that we must not disturb the economy too much in those days," explained Horace Albright, who resigned as the second director of the National Park Service to become the general manager of U.S. Potash in 1933. Similarly, Potash Company of America, short on cash, later successfully appealed to the federal government to be allowed to pay less than the federally mandated wage of twenty-five cents an hour. Albright called this a "racial wage," noting, "I don't know of any white people that got as low as 15, 20 cents an hour."[15] The requirement that all workers in higher-paid positions in the company shops speak English abetted segregation.

According to Albright, the goal of the potash firms in Carlsbad was to hire as few Mexican American workers as possible "because the saying was, 'You hire a Mexican, and after he earns $5 he'll lay off, he'll buy a new pair of overalls if he needs them, he'll buy some beans, and some chili, and then he'll gamble the rest of it.' . . . They weren't reliable, and they aren't today, in many cases, in many parts of the state." Albright, like many other employers of the time, was openly discriminatory: "When I first went down there, it was evident that these people of Mexican origin not only lived very simply and very poorly, I thought, but there seemed to be a feeling on the part of the local people that you couldn't do anything with them." Labor shortages during World War II forced Carlsbad potash firms to hire more Mexican American workers, but Carlsbad miners were still largely Anglo workers from southern states.[16]

The potash industry faced unique economic challenges. While copper had high value-added military and industrial uses, potash is a key ingredient in a rather humble commodity: fertilizer. In an age of copper wiring and a burgeoning defense industry, copper was a fairly steady seller, although its price fluctuated over time. Potash mining companies, however, could increase demand only by convincing fertilizer firms to use more potash.[17] In an effort to market their product more broadly, potash companies began publishing the magazine *Better Crops with Plant Food* in 1923, and in 1935, they founded the American Potash Institute to fund soil science research. In World War II, the government diverted the purer potash for use in chemicals valuable to the wartime defense industry. This move forced potash companies to pull back on their established business with fertilizer manufacturers and endangered their bottom line. Potash companies faced other financial setbacks as well. In one instance, Pecos Valley farmers sued potash producers, claiming that the salt byproduct of potash production was being dumped in the Pecos River and ruining their crops.[18]

Despite these obstacles, by the late 1940s, the original three companies in the potash basin had been joined by the Duval Potash and Sulphur Company; Southwest Potash, which was a subsidiary of American Metals Climax Company; and National Potash, which was a subsidiary of Freeport Sulphur. Over a twenty-year period, the potash industry transformed Carlsbad from a sleepy town of between twenty-five hundred and three thousand people to a small city of twenty-five thousand. Carlsbad Caverns had brought in some tourist traffic, but now, Carlsbad was "built on potash, operated on potash."[19]

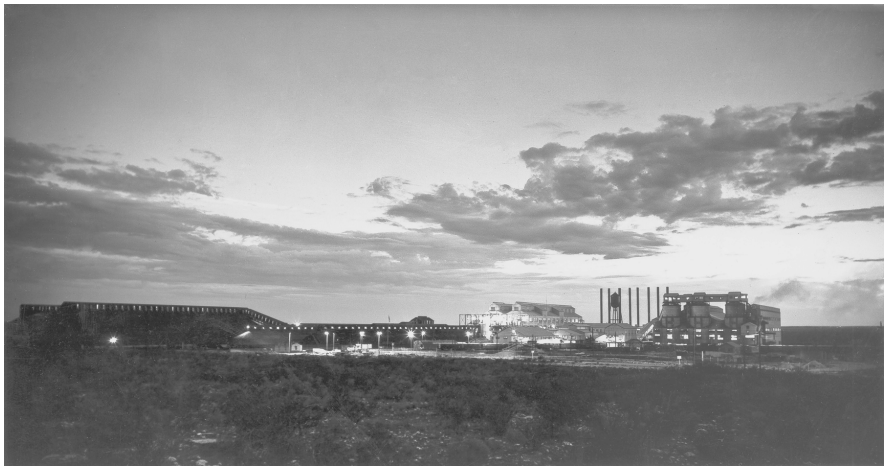
By the 1950s, Carlsbad potash was king, though a coup was on the horizon. Canada, which possesses about 75 percent of the world's potash reserves, brought ten potash mines into production between 1962 and 1971. At first the Canadians were able to serve only as "residual suppliers" because the United States had contracts with many fertilizer producers, but this did not remain the case for long. The entry of such a vast supply into the market depressed prices, and Canada was accused of dumping potash at below-market prices.[20] Carlsbad residents ranging from middle-school students to mine workers to professionals flooded their local congressman's office with petitions for protective legislation to block the importation of cheap Canadian potash.[21] The low profit margins in potash and the tenuousness of the industry were clear to Carlsbad workers, who had to balance demands for workplace changes against the health of the industry.

Unionization

Although the mining workforces of Grant County and Carlsbad differed in ethnic composition, economic challenges, and the degree of paternalism practiced by their companies, they both organized under the same union: the International Union of Mine Mill and Smelter Workers (Mine-Mill). Mine-Mill was the second incarnation of the radical Western Federation of Miners, which had gained notoriety in the very early years of the twentieth century for its militancy and intense conflicts with mining companies. Although Mine-Mill's presence in Grant County dated back to the 1930s, when it organized the American Smelting and Refining Company's (ASARCO's) mine and mill into Local 890, the union made serious inroads into organizing Mexican American workers during World War II.[22] Mine-Mill in Grant County became known as the "Mexican Union" because 90 percent of Local 890's membership was Mexican American, and meetings were held in both Spanish and English.[23] As historian Christopher Huggard notes, the members were energized by labor and social activist Clinton Jencks, who, with his wife Virginia, inspired Mexican American workers to see their struggles against

local copper mines as part of a larger proletarian struggle.[24] By the end of the 1940s, Mine-Mill's Local 890 had become a greenhouse for the cultivation of leadership. Mexican American candidates ran for local offices; mineworkers formed a chapter of the Asociación Nacional Mexicana Americana (ANMA), a civil-rights lobbying group; and Mexican Americans began to be elected to Mine-Mill's executive board.[25] A burgeoning national Mexican American civil rights movement provided additional solidarity.

Mine-Mill moved into Carlsbad after World War II, forming Local 415, and the Potash Company of America signed a collective bargaining agreement under their auspices in June 1946. The agreement raised the prevailing wage by almost twenty cents an hour; offered wage premiums for the second and graveyard shifts; provided a life insurance policy and medical, hospital, and retirement benefits; and rewarded workers with a week's paid vacation after one year on the job. The agreement also created a safety committee, which worked with the mine's safety inspector, inspected the mine and surface plant monthly, and made suggestions for improvements. This deal was similar to those that Mine-Mill and other unions struck with other companies in Carlsbad. Unionization at International Minerals and Chemical Corporation, for example, brought workers increased base rates, bonuses, and a safety program that, while neither "flashy" nor "spectacular," was "continuously stressed by the supervisory staff. Safety is kept in front of each employee as often as is practicable and possible."[26] Three-man committees from each department conducted regular safety inspections. Finally, unionization brought Carlsbad miners changing rooms, lunchrooms, and a public pool.



ILL. 1. CARLSBAD'S U.S. BORAX POTASH REFINERY DOMINATES THE LANDSCAPE *(Photograph courtesy New Mexico State University Library, Archives and Special Collections, neg. no. 03860015)*

Mine-Mill forced Carlsbad mine operators to recognize that the employer-employee relationship was not naturally harmonious. In 1948 and 1949/50, the miners went on strike at the Carlsbad potash mines over various grievances, including absenteeism policies. When the companies responded with an injunction under the Taft-Hartley Act, opening the picket line to strikebreakers and enjoining the miners from picketing, workers' wives and children took over the picket line, just as they would in the Empire Zinc strike in 1951.[27] By the mid-1950s, Local 415 had more than a thousand Carlsbad members. They participated enthusiastically in that union's culture, holding a March of Dimes baby-picture contest and square dances to keep the membership together, building a luxurious union hall with an auditorium that seated three hundred people, and publishing their own newspaper, *Potash Dust*.

But Mine-Mill's dominance in Carlsbad was short-lived for several reasons. As historian Jack Cargill points out, despite their efforts at solidarity, striking Carlsbad workers lacked the community resources possessed by Grant County miners. In Grant County, miners gravitated toward Mine-Mill as a minority-serving union that could address their civil rights concerns. Workers in Carlsbad, however, divided into small bargaining units, which were constantly "raided" by other unions seeking to represent them, including the stoneworkers, an independent potash workers' union, and the United Mineworkers.[28] Another obstacle to the success of Mine-Mill in Carlsbad was that the union was known for its aggressively class-conscious rhetoric and for the communist leanings of some of its leaders. (Local 890's representative to the international union, Clinton Jencks, found himself subject to federal prosecution in a high-profile case concerning his communist past.) Many Grant County miners appreciated the communists' reformism, but Carlsbad workers who chose Mine-Mill lived under the pressure of constant red-baiting by the editors of Carlsbad's local newspaper, the *Argus*.[29] During the second week of March 1953, both the Bayard Local 890 and the Carlsbad Local 415 suffered mysterious fires in their union halls. While passing union members noticed the Bayard fire and saved the hall, the Carlsbad hall burned to the ground.[30]

The negatives of union membership outweighed the positives for many potash workers in Carlsbad, who drifted away from Mine-Mill and gravitated first to one union and then to another. Local 415 disbanded in the 1950s. In contrast, by the time Grant County's Mine-Mill Local 890 was absorbed into the United Steelworkers Association in 1967, it had a long enough and strong enough history to be allowed to remain a self-contained organization within the Steelworkers.[31] As copper workers and potash workers faced the challenges of the dangerous workplace, copper workers had the upper hand.

Death Comes for the Miner

Miners faced a number of potentially deadly dangers on a daily basis, although injury accidents far outnumbered fatal accidents. Between 1948 and 1951, for example, Carlsbad's potash companies experienced a total of five fatal accidents all together. From the beginning of 1950 through April 1951, U.S. Potash alone reported fifty-six lost-time accidents, ranging from strained tendons to lacerations and broken digits.[32] If U.S. Potash was at all typical, there were more than ten lost-time accidents in Carlsbad for every potash fatality.

But the possibility for a fatality lurked around every corner. In underground metal mines, roof falls were a central occupational hazard. Before entering a particular stall to begin mining, miners were supposed to tap the roof to see whether it produced a hollow sound that indicated it might be loose. This was not an exact science, however, and a ceiling that failed to make a "drummy" sound might still fall and kill a miner.[33] In 1950 Florencio Eli Esquibel at Kearney Mine, in Hanover, New Mexico, went to "bar down" a piece of rock that was hanging in place from the previous night's shift and it fell on him. The piece of rock broke his back, broke his leg in several places, and produced fatal shock and hemorrhage. In 1973 a twenty-nine-year-old worker at ASARCO's Groundhog Mine in Vanadium, New Mexico, was killed instantly while "scaling down" or using a tool to remove loose walls in a drift. Another miner was found with his face buried in muck up to his ears; his body had to be extracted with a hydraulic jack.[34]

Roof falls were not hazardous solely in metal mines. In 1958 James "Shorty" Powell, a potash miner working under a slab that had been partially barred down and judged safe to work under, was killed when a ten-foot-square piece of roof landed on him. The most serious kind of roof fall was caused by a "blowout," in which boring equipment hit an air pocket, causing an explosion. Ten potash miners were injured in the National Potash Company's mine when an air pocket caused the collapse of a three-hundred-foot-long section of roof in 1974.[35]

Other accidents occurred when mining machinery met the human body. In 1953 Bill Richardson, a fifty-two-year-old potash churn driller, fatally fractured his skull when a pulley sheave, lacking a safety cable, separated from his drill.[36] Billy Kemp, a twenty-nine-year-old potash miner, became entrapped in the moving parts of a conveyor belt. Although no one witnessed the accident, the mine inspector concluded that Kemp must have been attempting to fix the conveyor belt when it was in motion.[37] Miners could also be killed after losing their footing or when being raised from or lowered to the working level.[38] In 1948 Elauterio Gonzales was fatally injured when the

skip he was riding caught on a piece of steel and he plunged two hundred and twenty-five feet to the bottom.[39] In 1967 three miners were hospitalized after one of the three slipped from a platform at the 1300 level (that is, thirteen hundred feet below the earth's surface), fell forty feet, and crashed into the other two miners.[40] David White, the face boss at Carlsbad's International Minerals and Chemical Corporation mine, was killed in March 1950 while riding up in an elevator with twelve other employees. The elevator operator misinterpreted the bell signals that were sent to him to raise and lower the elevators, causing two elevators to come to the collar at the same time. White was crushed between the collar and the cage. In 1957 Clinton Conaway was killed in the elevator of the U.S. Potash Company shaft when a falling object hit him on the head.[41]

Blasting led to some of the more horrific multivictim accidents. In 1947 four workers ranging in age from twenty-two to thirty were killed at the copper mine in Fierro, New Mexico, when the dynamite charge that they were preparing detonated before they had time to clear the area. A Hanover copper miner was killed and two more injured because of confusion about whether all miners had been cleared from an area prior to blasting (two of the miners shared the nickname "Red"). Three workers at Phelps Dodge's Tyrone mine were killed in 1949 when trying to prepare thirty-eight blasting holes simultaneously.[42] Even in an open-pit mine, the dynamite used in blasting could ignite and pose a danger. In 1954 a truck exploded at Kennecott Copper's Santa Rita mine, killing four workers. The state and federal governments conducted side-by-side investigations, but the cause of the blast remained unknown.[43]

ILL. 2. THE AFTERMATH OF A BLASTING TRUCK EXPLOSION AT SANTA RITA IN 1954 *(Photograph courtesy New Mexico State University Library, Archives and Special Collections, neg. no. 03200276)*

Vehicles moving underground across unstable terrain also threatened miners. Forty-two-year-old Ervin Wells, a bulldozer driver at Phelps Dodge's Tyrone mine, was killed when his bulldozer toppled off a muck pile, down a shaft, and onto another level of the mine, traveling end over end until the cab smashed. The mine inspector concluded that maneuvers like the one Wells was attempting should be permitted only in daylight, under

direct supervision, and with equipment mounted on crawlers rather than wheels. Wells was still assigned the blame for "failure to properly evaluate the hazards of the job" and "deviation from the established method of doing the job."[44] Willard Rhinehart, a Southwest Potash Company employee, fell to his death from a moving train of empty mine cars in 1962. William Smart backed a shuttle car into an overhang and was crushed in 1967, leading to a reconsideration of the requirement to move cars in reverse underground. In 1987 Roy McDaniel, a worker for the Lundberg Industries potash mine, was crushed to death by a continuous mining machine.[45] Achilles Perini, a miner with thirty-one years of experience, was run over by a truck that had slipped on the block placed under its wheel.[46]

ILL. 3. MECHANIZATION AT A CARLSBAD POTASH MINE IN 1960
(Photograph courtesy New Mexico State University Library, Archives and Special Collections, neg. no. 03860010)

Exposed electrical wiring was particularly menacing to potash miners. In 1940 William "Slim" Williams was electrocuted by 2200 volts while working alone on a power line at the Union Potash and Chemical Company. Tony Garcia, a worker at Potash Company of America, was burned over half his body when his scooter contacted a 440-volt cable underground in 1973. Sam W. Jordan Jr., an electrician at International Minerals and Chemical Corporation, died while trying to repair a fan.[47]

Although the cost of workplace fatalities to companies rose over the twentieth century, the proportion of loss borne by a worker and his family remained disproportionate to that absorbed by the mining companies.[48] Native New Mexican Richard L. Sierra grew up in a household headed by his widowed mother, a laundress. The fifth of eleven surviving children, Sierra worked

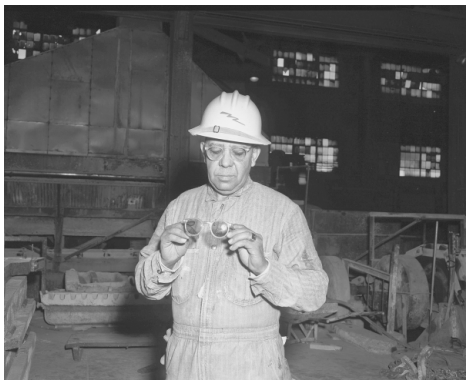
in the copper mines at an early age to support his own family.[49] On 22 May 1962, Sierra, repairing a shaft for the Peru mining company, stood on a ladder with a rotten rung. He fell and severed his spinal cord. Sierra's accident occurred during a period of particular scrutiny of mine accidents; federal regulation of copper mines was under discussion, and accident statistics were being systematically collected. The U.S. Bureau of Mines recommended that New Mexico mines replace their defective ladders and landings and require men working in the shafts to wear safety belts.

Mine-Mill, Sierra's union, policed compliance with these new regulations, but it was too late for Sierra.[50] At age forty-six, he went from being his large family's breadwinner to being dependent on his wife and son and was confined to a veterans' nursing home at Fort Bayard. With great patience, he exercised his hands enough to pull himself up to a seated position using a crossbar above his hospital bed. He wrote poetry about brave World War II veterans and coached little-league baseball on weekends from a portable wheelchair.[51] Six years after the accident, at the age of fifty-three, Sierra died of a heart attack at home, leaving behind three sons, five daughters, and ten grandchildren.[52] Southern New Mexico newspapers reported little beyond the bare fact that a fatality or a disabling accident had occurred in a mine.[53]

In all, the New Mexico state mine inspector recorded one hundred and ten fatal accidents for southern New Mexico mines between 1933 and 1974. In the Grant County area mines, forty fatalities occurred over these four decades, with twenty-six occurring between 1949 and 1954. In fact, after 1956, one fatality or no fatalities in a given year became the norm there. In contrast, the Carlsbad mines reported no fatalities until 1948. From then on, the number of fatalities remained steadily higher than in the Grant County mines: eight fatalities between 1959 and 1961, six in 1964–65, six in 1966–67, and six in 1972–74. Between 1948 and 1974, the Carlsbad potash mines recorded a total of fifty-four fatalities.[54]

There were a number of factors that contributed to the increase in Carlsbad mine fatalities while those in Grant County decreased. One factor was that one of the largest mines in Grant County was an open-pit mine, where fatal accidents were less likely. Further, more militant unionism in Grant County led to several protracted strikes. Since the number of mine accidents is directly related to the amount of productivity, when the mines were shut down or nearly so during a strike, the opportunity for accidents decreased. Moreover, roof bolting was used more frequently in metal mines than in potash mines, Carlsbad mines were still using moving vehicles underground rather than safer conveyor belts, and the potash mines appear to have had a much greater problem with exposed high-voltage wires.[55]

There was also a difference in safety culture between the two areas. Kennecott Copper, one of the largest employers in the Grant County region, promoted itself as a leader in safety.[56] Workers were required to wear hard hats, safety goggles, and reinforced-toe boots beginning in 1957. Miners who used safety gear were publicly inducted into safety societies: the "wise old owl" club for vision protection, the "golden shoe" club for feet protection, and the "turtle club" for head protection (its motto: "Shell on head: we're not dead").[57] Kennecott had its own safety mascot, "Sammy Safety," a cartoon character with a hard hat and a circle body emblazoned with "Green Cross for Safety" across the front. Employees at Kennecott's Hurley smelter and Chino mine had annual safety competitions; all employees at whichever plant had the fewest injuries would receive free turkeys, free hams, or green stamps usable at the store.[58] A later campaign involved "safety stocks," in which each department had its own imaginary stock price that would rise and fall with the number of injuries.[59] The attempt to build a positive safety culture was sometimes accompanied by browbeating. In



ILL. 4. REYES G. TORREZ WITH SAFETY GLASSES
(Photograph courtesy New Mexico State University Library, Archives and Special Collections, neg. no. 03200302)

ILL. 5. SAMMY SAFETY'S NEW CONTEST CAN MEAN HAM FOR EVERYBODY!
(Photograph courtesy New Mexico State University Library, Archives and Special Collections)

ILL. 6. SANTA RITA MINE WINS SAFETY CONTEST 1960
(Photograph courtesy New Mexico State University Library, Archives and Special Collections, neg. no. 03200457)

1959, when there were nine lost-time accidents and a fatality, the editor of the company's in-house newsletter, *Chinorama*, chided, "The carelessness, the thoughtlessness, and the slightly unsafe work habits that caused these accidents cannot be undone. Split seconds caught up with nine Chino employees."[60]

Kennecott's work in this area resulted in objective gains. In 1957, for example, the company reported only 5.89 lost-time accidents per million man-hours, compared with 11.20 for surface mining nationally. By 1970 the company had improved to 3 lost-time accidents per million man-hours, compared with 6.47 in the industry generally and 15.88 in non-coal mining. The company won national awards for its low lost-time accident record on multiple occasions.[61] None of the Carlsbad-area potash mining concerns had such a thoroughgoing safety program.

Responsibility for Workplace Accidents

Every fatal mine accident in New Mexico triggered a bureaucratic process. In the 1930s and 1940s, coroner's juries investigated mine accidents: a panel of local men would convene to question the dead man's workmates and employers. Coroner's inquests routinely endorsed prevailing opinions about the causes of mine accidents—that they were truly accidental or, even worse, caused by worker negligence. The cross-examination of one mine supervisor

after a fatal accident is illustrative:

> Q. There was no doubt that it was just an accident?
> A. No.
> Q. Unavoidable at that?
> A. Yes.
> Q. One of those unpleasant situations in life?
> A. Yes.[62]

Coroner's juries had a tendency to classify all mine-related deaths as accidental.

By the end of the 1940s, the New Mexico mining inspectorate routinely investigated mine-related deaths and made recommendations. At first, similar to the coroner's juries, mine inspectors blamed workers for most accidents. At the Burro Chief fluorspar mine in Tyrone, New Mexico, where men had to wait for timber to be delivered to prop up ceilings, a roof fall killed miner LeRoy Jones, an accident that might have been avoided if the ceiling had been properly supported. In this case, mine inspector John A. Garcia (New Mexico mining inspector from 1947 to 1959) ruled that "the prevention of accidents requires cooperation between officials and employees, and such cooperation can be attained only when the employees obey and carry out orders given by the supervisors and company officials . . . your mine foreman has full authority to fire any employee that does not carry out his orders. Furthermore, any contract work on a large scale shall be discontinued." Jones's accident was recast into a question of the contract workers' failure to obey orders; although there was no evidence that any relevant orders had been given.[63] Garcia noted in another case that "testing of backs, and barring down is the sole responsibility of individual workmen; therefore, in the interest of mine safety I strongly recommended that individuals who insist on taking chances and do not bar down be penalized."[64]

The state mine inspector worked with deputies drawn from the industry who were seemingly biased in their evaluation of evidence. A shaftsman at ASARCO's mine in Vanadium was found dead after a five-hundred-foot fall down a shaft. Oddly, the body seemed to have touched neither the sides of the shaft nor the bucket suspended in the shaft. D. Bruce Leake, a deputy mine inspector who had operated several mines in Grant County from 1948 to 1950, noted, "In view of the fact that we do not know what caused the deceased to fall or how the body could have passed by the xhead and bucket in its fall, I feel free to exonerate the company and all individuals concerned of any responsibility for the accident which caused this man's death."[65] A shaftsman

at the Bullfrog mine in Bayard was cleaning muck when an eight-foot-long, six-foot-wide, one-foot-thick piece of mine wall fell on his leg, requiring an amputation at the scene. He died shortly after arriving at the hospital. Leake assigned no responsibility for the accident, since propping up the roof of the mine with more timber would have prevented blasting, the ground looked safe, and there were no fractures. "It was one of those unforeseen hazards that exist in mining and is so difficult to guard against," Leake said in his report.[66] In a case of electrocution, Leake opined that electricians seemed to believe that they could get a heavy shock but not die from the 220-volt current. "Over 90 percent of all accidents are caused by violations of the safety rules," he noted.[67] And after nine blasting-related deaths in the Grant County region in three years, Leake blamed the miners, who should have known how to keep themselves safe. "In combating this condition of carelessness it is suggested that a program of nagging be instituted. Nag the man that leaves powder where it should not be. . . . nag the man that takes any chances with explosives . . . and if he won't take heed, FIRE HIM."[68]

In the 1950s, the union and the public airing of information about safety were beginning to have an impact, and the attitude of the state mine inspectors and deputy inspectors shifted considerably. Rather than holding miners responsible, they started issuing specific suggestions for safety modifications designed to keep workers out of dangerous situations entirely and blaming supervisors for lapses.[69] When a worker who was out of his working place was killed by moving machinery in a crusher, Inspector Garcia suggested that an unfenced area of the machinery be fenced.[70] When a mucker was knocked onto a track by a runaway train—an issue that the mine had never had before—Garcia blamed lax supervisory practices.[71] Garcia called a man's death in a conveyor-belt accident "inexcusable," since it would have been straightforward to screen the machinery. Because deputy mine inspectors were scarce, Garcia urged workers to be the frontline of safety by refusing to work in unsafe workplaces.[72] Supervisors were not as keen on this new approach, however, and miners taking this attitude could find themselves fired and blacklisted. One miner who was buried in a potash-mine rock fall for eleven hours was asked at the hospital about the state of the mine before the accident. He said, "I told my wife some time ago that someday some of us are going out there and not come back. That has been six or eight months ago. We have been on lots of stuff that has been very treacherous looking. You know what happened when three of our boys refused to go into a place not too long ago and at my age I can't get out and find work. I have my family to support and I just try to do what they ask me to do."[73]

Worker Safety and Worker Action

Though subject to dangers on the job and only partially protected by state mine inspection, mine and smelter workers in southern New Mexico did not adopt a fatalistic attitude toward mine safety. Instead, beginning with the advent of unionization in New Mexico's mines in the late 1940s, workers followed a three-pronged strategy to pursue change: at the job-site level, largely through safety committees; at the community level, through union-led job actions and grievances that could include state-level lobbying; and at the federal level, by lobbying through Mine-Mill for effective regulatory legislation to be extended from coal mining to metal and nonmetal mining.[74]

Workers participated in safety at the job-site level by demanding to be a part of the rule-making process, a move that has resulted in lower accident rates.[75] Mine-Mill insisted that safety committees composed of workmen, safety engineers, and foremen be a touchstone of each contract. Safety committees inspected plants, pointed out infractions, investigated lost-time and fatal accidents, and liaised with union representatives.[76] Carlsbad Local 415 maintained a safety committee that pointed out violations and problems directly to the potash companies.[77] The union also printed up handbills for distribution to the workforce that detailed companies' safety violations and the union's crucial role in promoting safety compliance.[78]

Families witnessed workmates' and employers' post-accident depositions, or hired lawyers to find out whether the companies had broken safety laws. Occasionally family members were allowed to question witnesses during safety hearings, and their presence clearly elicited sympathy from company representatives. If family members did not participate in a given accident investigation, a worker's union brothers might.[79] Excluded from an investigation into a worker's death, Clinton Jencks, the Mine-Mill International's representative to Local 890, hired a Silver City lawyer to question witnesses and defend the dead man's reputation. In another case, Jencks announced that he was "counsel for the deceased."[80] The union also arbitrated workers' compensation cases: when Jesus Pedraza injured his back at Kennecott Copper and was compensated and then fired, the union sought arbitration and the arbitrator ordered the company to reinstate him.[81]

The first week of June 1961 was dire for southern New Mexico's miners, with two fatalities in the potash mines and one at Kennecott Copper's Hurley smelter. At the investigation into the Kennecott Copper death, Local 890 president Juan Chacon loudly confronted state mine inspector William Hays (inspector from 1959 to 1973). Kennecott Copper alleged that the miner had committed suicide by crawling into machinery; Chacon sought to introduce

evidence that the company had ignored workers' complaints about unsafe machinery. Hays was willing to hear him out: "There can't nobody come in and take over the hearing and call their witnesses and ask questions, but if you have anything that you want cleared up or anything, we'll clear it up," Hays said.[82]

Unions also advocated safety through direct action. Most famously, members of Mine-Mill Local 890 physically portrayed the importance of workplace safety by agreeing to appear in *Salt of the Earth* (1954), a film based on the strike at Empire Zinc in 1950 to 1952 in Bayard, New Mexico. In the film, an accident dramatically precipitates the miners' walkout. After the injured miner is taken away on a stretcher with his wife running after him, his workmates confront the mine owner and the foreman. The film's male protagonist, Ramon, played by Local 890 president Juan Chacon, tells the foreman that this was bound to happen when men were assigned to work alone rather than in pairs, and that it was the foreman's job to signal when an explosion was impending. The foreman claims that he did signal an impending explosion. The mine owner then notes that he does not like accidents either, and that the company has more to lose from an accident than the workers do.[83] This short scene depicts many of the issues at stake in mine accidents—including the assignment of blame after the fact.

Getting little recognition from the companies for their grievances about mine safety, unions started communicating directly with the state mine inspector. Carlsbad's Mine-Mill Local 415 president E. N. Gibbs continually consulted with Inspector Garcia about possible safety violations, and Garcia encouraged Gibbs to warn his men against working in unsafe areas.[84] The United Mine Workers and the International Brotherhood of Electrical Workers also consulted with Garcia about potash mine safety issues.[85]

In 1956 three Carlsbad workers constructing a shaft for the National Potash Corporation were killed and two were injured in a mine elevator. The elevator's safety device should have stopped the cage, but it had been removed to clear an obstruction, and the cage fell to the bottom of the shaft—a distance that witnesses estimated to be between 100 and 230 feet—with the helpless men inside. After the cage plummeted to the bottom, the heavy cable fell on top of it, compounding the men's injuries. In his report about the accident, Inspector Garcia concluded that the union and company management had mutually agreed to remove the safety device, so that the men, as union members, bore responsibility for their own deaths.[86]

The Carlsbad elevator incident precipitated a call for change.[87] Prior to the incident, Carlsbad workers had asked that a deputy mine inspector be assigned to Carlsbad, to no avail. Instead, the deputy mine inspector assigned

to Las Cruces (180 miles away) responded to all accidents in southern New Mexico. Union leaders had banded together, organized by W. S. Roberts, secretary of the New Mexico American Federation of Labor, hoping to find strength in numbers. Inspector Garcia met representatives of Mine-Mill and other unions, like Local 355 Operating Engineers, that represented parts of the Carlsbad workforce. After the meeting, Garcia said the main obstacle was financial: there just was not money in the department's budget to pay another deputy's salary.[88] After the incident in Carlsbad and in response to an enraged public reaction, the State Board of Finance agreed to the unions' demands and granted Garcia's department $20,000 to hire two new deputy mine inspectors: one for small mine operations and one for the Carlsbad area. Two inspectors were chosen to temper any criticism that the potash industry was being singled out for special treatment.[89]

Another uproar occurred in 1960, when thirteen miners died in uranium mines in Grants, New Mexico, and two men in Carlsbad potash mines.[90] The sudden spike in fatalities prompted press investigations, which revealed that even when inspectors cited mines as unsafe, mine operators often failed to correct unsafe conditions without being sanctioned. Facing a reelection challenge and public pressure, Gov. John Burroughs put together a nine-member mine safety committee consisting of an industrialist, two professors from the New Mexico Institute of Mining and Technology, three mine managers, and three workers' representatives.[91] After a series of meetings, the safety committee blamed the U.S. Atomic Energy Commission for safety failures, since it had pressured uranium companies into demanding the production of uranium at an unsafe rate.[92]

In reaction to the report, labor leaders held their own mine safety conference in September 1960. They called for mine inspections three times annually rather than once, for certification of all underground miners, and for acts that disregarded mine safety to be classified as felonies. They also decided that miners should learn first aid, and should never be required to do solitary work out of earshot of others. Although Inspector Hays attended the conference, he protested that his department would need a budget of $100,000 ($15,000 more than he had been allocated) to comply with all these demands.[93]

Direct action sometimes included strikes in support of workplace safety. In 1974 a sixty-four-year-old miner who had suffered a heart attack underground at the former Empire Zinc mine died before he could get to a hospital. The company-provided ambulance was not in good repair and its engine would not start. Two days later, a similar incident occurred at the Kennecott mine: the ambulance stalled on the way to the hospital and could not be restarted.

Local 890 of the United Steelworkers—formerly of Mine-Mill Bayard—reacted to the incidents with a walkout. The men refused to go back to work until the company provided a new ambulance, which they did two weeks later.[94]

A similar case occurred in 1975 at ASARCO's zinc mine in Vanadium when an industrial accident caused Jose Villegas, a twenty-eight-year-old motorman, to be fatally injured by the equipment he was operating. Found by his coworkers, he had to be transported from the plant to the hospital in a pickup truck because there was no way to get an ambulance out to the mine. After an almost two-hour delay, Villegas arrived at the hospital and was declared dead.[95] ASARCO officials demanded that the men return to work. Instead, eighty-six workers went on a wildcat strike (a strike without union authorization) to demand an ambulance for their facility. While the United Steelworkers did not support the strike, they refused to exert pressure on the workforce to go back to work. In response to the miners' demand for an ambulance at the facility, officials noted that there was no ambulance clause in the miners' current contract, that the contract did not expire until 1976, and that an ambulance would cost $7,500.[96]

The Quest for Federal Regulation

New Mexico's mine inspectorate exemplified a number of shortcomings common to regulatory agencies in western states. First, the New Mexico state constitution specified that mine inspector candidates must have years of practical mining experience. Nonetheless, the position was politically appointive, resulting in a triangulation among politicians who could bestow favors, mining companies seeking to place former employees in influential government positions, and unions eager to promote their own candidates (or at least block hostile candidates). Second, mine owners and operators were legally compelled to report only fatal accidents to the state mine inspector. As a result, some very serious accidents went unreported, and it was difficult for the mine inspector to gather information about the dangers of mining.[97] Third, the inspector's office was underfunded. Without a deputy inspector in each mining region, the mine inspector and his existing deputies had to drive across the state at a moment's notice after every serious accident. To make matters worse, they had to fight the state finance board for vehicles capable of making the trip.

Mine inspectors also had to negotiate a peculiar line between attempting to eradicate workplace accidents and alienating a wealthy and politically influential segment of the state's constituency. The mine inspector often solved this problem by holding extended hearings in the wake of every serious accident

(a process that enabled the story of each accident to be told and emotions aired in a very controlled setting), but then failed to assign accountability to any party in particular. As Inspector Hays explained in every hearing over which he presided, the purpose of the exercise was not to point fingers, but rather to see whether any suggestions might be generated to prevent similar accidents from happening in the future.

In 1962 a memo drafted by the leadership of Mine-Mill listed some of the methods companies used to dodge the spirit of state laws, if not the letter. To avoid reporting a lost-time accident, a company might "encourage" an injured worker to take his vacation, so that none of the company's work time would officially be lost. Local 890 reported just such a case to the Mine-Mill leadership during a safety study undertaken in 1962/63 to support the need for federal regulation.[98] A worker who would earn less than 50 percent of his normal salary under worker's compensation might be tempted with the prospect of receiving his entire salary in return for reporting to work, even if this meant just sitting around on the job or undertaking "light work" of some kind. Companies might also pressure crews to work shorthanded while the company paid the injured crewmember, a practice that exposed the remaining workers to additional risk. When a man failed to file for workmen's compensation and a company failed to report an accident, the company's insurance premiums remained low, statistics of accidents were artificially deflated, and the injured worker lost the right to collect payment for a re-injury or a flare-up of the same injury later. New Mexico's mine workers knew the potential benefits of federal regulation under these circumstances. As metal miner Lorenzo Torrez noted: "A state inspector is usually an elected position and thus subject to local political pressure. Not so with the federal inspector."[99]

New Mexico's mine operators, as members of the New Mexico Mining Association (NMMA), developed close relationships with the state's mine inspectors and consistently opposed federal regulation. To downplay the need for federal oversight, they frequently boasted about the state's achievements. By the mid-1960s, seven state inspectors and deputy inspectors worked in New Mexico while only one part-time federal Bureau of Mines representative canvassed the state. Between 1960 and 1965, the mining association established central mine rescue stations in Grants, Silver City, and Carlsbad and formed a safety committee consisting of all the safety engineers from its component mines.[100] Other arguments against federal regulation were more strained. The mining association claimed that its safety campaigns had inculcated a sense of personal responsibility for mine safety among mineworkers, and that this sense of responsibility would be undermined if federal inspectors

visited New Mexico mines.[101] The fact that the NMMA moved so quickly to institute industry-level reforms in the 1960s shows that even the threat of federal regulation could effectively motivate change.

Mine-Mill had been lobbying for federal oversight of metal and nonmetal mining since the mid-1950s, but a brief flurry of congressional investigation of the issue in 1957 came to nothing. As the campaign restarted in the early 1960s, the union again presented evidence that metal and nonmetal mine regulation was needed. In 1961, after intensive union lobbying, Congress agreed to fund an official study of the extent of unsafe practices in metal and nonmetal mines and the efficacy of voluntary accident reporting versus mandatory reporting. Stewart Udall, secretary of the interior from 1961 to 1969, headed the committee that conducted the study. Mine-Mill Local 890 wanted to ensure that safety committees existed at each mine so that committee representatives could accompany Udall's staff on fact-finding tours of the plants chosen to be part of the government's surveyed sample. Mine-Mill's research director at the time, Arthur Stuart, predicted that "Kennecott will probably welcome this"; he thought that other operators might oppose it.[102] Mine-Mill also asked its leaders to collect their own statistics on workplace accidents over the course of the study period, and specifically instructed workers to gather information about lost-time accidents at the Kennecott, Empire, and Peru mines.[103] Mine-Mill went on the offensive, noting that companies were already trying to keep mine inspectors away from the scenes of fatal accidents and that this was the "lowest kind of political interference in the work of a bureau which should be kept above politics in the field of safety."[104]

Udall's report, delivered to Congress in 1963, revealed a widespread problem with state-level mine inspection. More than ten thousand lost-time accidents occurred in metal and nonmetal mining during the study period, including more than two hundred fatalities and more than three hundred disabling injuries. Mine inspectors' recommendations were often ignored, and some mines failed to observe even routine safety procedures.[105] To address these concerns, on 29 July 1963, U.S. senator Joseph Montoya of New Mexico cosponsored federal mine safety legislation (the Metcalf-Montoya Bill) that had been written by Mine-Mill. This federal mine inspection bill would give federal regulators the right of entry to mines, require reporting of accidents, and enable the promulgation of federal safety codes in noncoal mining. The Johnson administration supported a different version of the bill that focused only on mines and mills (excluding smelters) and on major hazards. Other safety issues would have to be addressed in union contracts with firms rather than on a national basis.[106] In 1965 Colorado congressman

Wayne Aspinall attempted to undermine the federal mine inspection bill by introducing an amendment to exempt any states that had existing regimes of state mine regulation, unless their governors specifically opted in to federal oversight.[107]

Despite the opposition, the federal mine inspection bill went to committee in 1966, and Mine-Mill sent a lobbyist to monitor the discussion. The entire union constituency put pressure on the intransigent members of the committee (particularly Sen. Paul Fannin of Arizona).[108] During the negotiations, a mine explosion in Superior, Arizona, killed several workers. These fatalities gave the union the opportunity to call attention to the need for federal oversight in the mining industry by threatening to follow the example of the coal industry and its "miners' memorials." After a coal mine fatality, the mine workforce might walk off the job entirely, refusing to go back to work until after the coworker's funeral.[109] The bill was passed as the Federal Metal and Nonmetallic Mine Safety Act of 1966. In the end, federal inspectors were given primary responsibility, although state mining inspectorates were allowed to maintain many of their statutory responsibilities and to "cooperate" with federal inspectors. Further, federal inspectors could revoke permission for the state to have its own separate mine inspection program unless minimum standards were met. The entire apparatus was located in the Department of the Interior, but an appointive Federal Metal and Nonmetallic Mine Safety Board of Review was created for decision appeals—a move that, miners feared, would open the inspection process to political influence.[110]

Despite the passage of the federal mine inspection bill, southern New Mexico miners remained concerned that mine safety would be politicized. Carlsbad miner J. D. Rogers expressed this concern in a letter he wrote to Senator Montoya in the midst of Nixon's appointments to the U.S. Bureau of Mines: "The Super Market owner doesn't employ a cotton picker to butcher, the building contractor doesn't employ a truck driver to lay brick, so why should the Bureau employ anyone other than people with mining knowledge in this capacity? . . . The Bureau wasn't formed for the exclusive use of the mine owner as the American Mining Congress seems to think."[111] Metal and nonmetal mine safety got off to a rough start when the U.S. Bureau of Mines assigned just one man, Frank Memmott, to draft the regulations for metal and nonmetal mines. While Memmott was the son of a coal miner and had a postgraduate certification in coal-mining safety, he came to the Bureau of Mines directly from being a state legislator. He was assigned to the bureau's Seattle substation, despite Seattle's distance from mines, and was deprived of any administrative support. Not surprisingly he stepped down soon after

being appointed to the post.[112] The sloppy way in which the appointment was handled led to protests by four senators from mining states, including New Mexico's Montoya. Although Memmott was not reinstated, safety regulations and a federal inspectorate for health and safety in metal and nonmetal mines were created soon after. Carlsbad's Rogers immediately secured the job of safety inspector for the Carlsbad area.[113]

In the late 1960s and after, the system of sole state inspection of southern New Mexico's mines gave way to a nominally cooperative regime.[114] In reality, however, the state inspector of mines was on the scene to report most accidents before any federal inspectors. The state and federal inspectors' reports seem to indicate that federal inspectors used the state reports as a reference in their own findings. Although federal mine regulation was now a fait accompli, the state inspectorate continued to try to defend its particular brand of autonomy. When Inspector Hays wrote to Congress to extol the virtues of the New Mexico mine inspectorate, he used talking points supplied to him by the New Mexico Mining Association.[115]

Despite continuities with the previous safety regime, federalization enabled some improvements in mine safety. While the Federal Metal and Nonmetallic Mine Safety Act had a very limited enforcement mechanism, noncoal and coal mining achieved an equal regulatory footing in 1977 with the passage of the Federal Mine Health and Safety Amendments Act. The Department of Labor took over enforcement of mine regulations, and the responsible organization was renamed the Mine Safety and Health Administration (MSHA).[116] MSHA collects accident reports and makes accident statistics publicly available, helping interested parties determine which safety modifications can address multiple accidents.[117] Safety engineers have used this data to identify the overarching causes of workplace accidents—proximity to dangerous machinery, for example—and then devised solutions, like proximity sensors that guard against moments of inattention.[118] Experts have also identified different forms of human error, ranging from violation of a rule to distraction, obstructed vision, poor technique, or poor communication. By classifying human error into types, a different solution is found for each one. This "systems-based approach" no longer assumes that if a worker has a moment of frailty, then an accident is unavoidable.[119]

* * *

Despite the fact that the copper and zinc mines of Grant County and the potash mines of Carlsbad developed through different processes, southern New Mexico mine workers—particularly those of Grant County—were instrumental in raising public awareness on the importance of mine safety.

Carlsbad potash miners, working in an industry besieged by low profit margins, had initial success unionizing, but under the pressure of competing unions, unfriendly companies, and red-baiting, they quickly lost the advantage. Ethnically homogeneous, bound together by the experience of discrimination, and represented by an effective union, the metal-mining members of Mine-Mill Local 890, however, were particularly successful. Using direct action, union safety committees, and lobbying at the federal level, they exerted pressure on a state inspectorate that was too closely intertwined with the mining companies to effectively identify the party at fault. The campaign for federal regulation also exerted an effect on the mining industry, pushing companies to band together to provide safety infrastructure in order to avoid being federally regulated against their will.

Reynaldo Delgado's story at the beginning of this piece shows that New Mexico workers and their families continue to influence the way that workplace accidents are interpreted and addressed. Delgado's death fell under the purview of the Workers' Compensation Act, which was meant to provide an "exclusive remedy" in the case of injury or death in the workplace. Under the act, Delgado's wife Michelle would have been entitled to only two-thirds of her husband's weekly wage for eleven years, or a maximum of $200,000.[120] Michelle Delgado challenged the traditional belief that her husband's death ought to be a predictable cost of mining.

While the district court and the New Mexico Court of Appeals rejected her claim for a civil remedy, the Supreme Court of New Mexico agreed with Michelle Delgado's construction of the issue. Workers' compensation, the court noted, was supposed to be a compromise: in exchange for certain compensation, workers and their families gave up their rights to sue for normal accidents. Until the Delgado case, workers who acted negligently on the job were prevented from collecting compensation, while employers who knowingly exposed their employees to danger were protected by workers' compensation. The Supreme Court noted that "to the extent that this case reflects an adverse development for employers, we remind Respondents that workers, whose families may depend for livelihood on the compensation received under the [Workers' Compensation] Act, have consistently been, and will continue to be, deprived compensation under the same standard we now apply to employers." All that a company needed to do to avoid consequences was to take due care, but this decision shifted that dynamic. "The greater the impact this opinion has on the workers' compensation system, the greater will have been its need."[121] Little by little, the idea that workers' fatalities are an unavoidable part of the toll extracted continues to erode.

Notes

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Interview with Anita and Lorenzo Torrez," handwritten autobiography, folder 17, box 1, and folder 14, box 2, MS 384, Torrez Papers, RGHC, NMSU.

24. Huggard and Humble, *Santa Rita*, 194.
25. "La Local 890 Ensueña Su Poder," *Union Worker* 6 (October 1953): 1, box 27, Union Worker, Local 890, El Paso, Tex., 1953, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM; and Baker, *On Strike and On Film*, 106.
26. George Harley and Walter Storms, *Mining Methods and Practices at International Minerals and Chemical Corp. Potash Mine, Eddy County, N. Mexico* (Washington, D.C.: U.S. Department of the Interior, Bureau of Mines, 1949), 14–15, 18.
27. "The Reminiscences of Horace Albright," in *Horace Albright, Mining Lawyer and Executive*, 664. The Taft-Hartley Act of 1947, sponsored by U.S. senator Robert A. Taft and representative Fred A. Hartley, was designed to amend much of the National Labor Relations Act of 1935 (the Wagner Act) and discontinued parts of the Federal Anti-Injunction Act of 1932. After resistance from labor leaders and a veto from Pres. Harry S Truman, the bill was passed on 23 June 1947. The Taft-Hartley Act placed a number of restrictions on labor unions, including banning the "closed shop" rule (under which workers had to join the union to be hired) and allowing the president to order temporary "cooling-off" periods for strikes deemed to imperil the nation's safety. The act also required union leaders to take an oath stating they were not communists. For more on the historical context and ramifications of the Taft-Hartley Act, see the U.S. Department of Labor's history site: www.dol.gov/oasam/programs/history/dolchp04.htm.
28. Sam Feldman, "We Win Carlsbad NLRB Elections," *Mine-Mill Union* 11 (1 December 1952), box 26, The Mine-Mill Union, Denver, Colo., 1954–1966, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM. A total of ten different unions had a presence in the Grant County mines, but most of them were craft unions with very small locals. See Kennecott Copper Corporation, editorial, *Chinorama* 3 (February 1957), RGHC, NMSU.
29. On Grant County miners' attitude toward communism, see Jack Cargill, "Empire and Opposition: The 'Salt of the Earth Strike,'" in *Labor in New Mexico: Unions, Strikes, and Social History since 1861*, ed. Robert Kern (Albuquerque: University of New Mexico Press, 1983), 246–53.
30. "Union Leader's Home Burned," *Union Worker* 5 (March 1953): 1, box 27, Union Worker, Local 890, El Paso, Tex., 1953, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM; and Baker, *On Strike and On Film*, 232.
31. See, for example, Al Skinner to National Officers, "Report on the Carlsbad Situation," 13 May 1958, folder 21, box 4, Maclovio Barraza, Executive Committee, 1955–61, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM; "Local 415 Wins Duval Run-Off," *Union* 11 (9 December 1952), box 26, Union, Denver, Colo., 1952–1954, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM; *Carlsbad (N.Mex.) Potash Dust*, 4 August 1953, p. 2, box 27, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM; and Robert S. Keitel, "The Merger of the International Union of Mine, Mill and Smelter Workers into the United Steelworkers of America," *Labor History* 15 (fall 1974): 36–43.
32. Accidents, U.S. Potash Company, 1950–51, folder 453, Non-Fatal Mine Accidents, ser. 5, New Mexico State Mine Inspector Records, Collection No. 1965–002, New

Mexico State Records Center and Archives, Santa Fe, New Mexico [hereafter Non-Fatal Mine Accidents, NMSMIR, NMSRCA].

33. See LeRoy V. Jones, Burro Chief Mine, Tyrone, New Mexico, 7 May 1947, folder 127, Fatal Accidents, ser. 4, New Mexico State Mine Inspector Records, Collection No. 1965–002, New Mexico State Records Center and Archives, Santa Fe, New Mexico [hereafter Fatal Accidents, NMSMIR, NMSRCA].
34. Florencio Eli Esquibel, Kearny Mine, Hanover, New Mexico, 29 August 1950, folder 161, Fatal Accidents, NMSMIR, NMSRCA; "ASARCO Worker Killed," *Silver City (N.Mex.) Daily Press*, 8 February 1973; and Folder 163, Fatal Accidents, NMSMIR, NMSRCA.
35. "Accident Victim," *Albuquerque (N.Mex.) Tribune*, 7 June 1958; and Folder 204, Fatal Accidents, NMSMIR, NMSRCA; and "Injured Potash Miner's Condition is 'Serious,'" *Carlsbad (N.Mex.) Daily News-Sun*, 29 November 1974.
36. "Injured by Pulley," *Clovis (N.Mex.) News-Journal*, 17 November 1953. See also Folder 180, Fatal Accidents, NMSMIR, NMSRCA.
37. *Fifty-Eighth Annual Report of the State Inspector of Mines to the Governor of New Mexico* (Albuquerque, N.Mex.: Office of the State Inspector of Mines, 1968), 39.
38. See, for example, Joe A. Martinez, Atwood Copper Mines, Lordsburg, New Mexico, 6 March 1946, folder 118; Jose Estrada, Atwood Copper Mine, Lordsburg, New Mexico, 18 January 1947, folder 122; and Eduardo Gonzales, Copper Flat Mine, Hanover, New Mexico, 13 March 1947, folder 123, Fatal Accidents, NMSMIR, NMSRCA.
39. Elauterio Gonzales, Continental Mine, Fierro, New Mexico, 15 May 1948, folder 133, Fatal Accidents, NMSMIR, NMSRCA.
40. Three years later, one of the injured was killed in the same mine when he was struck by an oncoming locomotive while cleaning a train switch. "Men Injured at Fierro Mine," *Silver City (N.Mex.) Daily Press*, 23 February 1967.
41. "Uncle of Clovisite Killed in Potash Mine Accident Tuesday," *Clovis (N.Mex.) News-Journal*, 5 March 1950; and "Mine Accident Kills," *Santa Fe New Mexican*, 21 April 1957.
42. Melquiades Moreno, Francisco Salas, Lorenzo Moreno, and Robert Garcia, 22 March 1947, folder 124; Harry Porter, Kearny Mine, Hanover, New Mexico, folder 125; and T. J. Morgan, Jose P. Medrano, and Carol E. Roberts, Phelps Dodge, Tyrone, New Mexico, 15 April 1949, folder 148, Fatal Accidents, NMSMIR, NMSRCA.
43. Jose S. Portillo, Andres R. Gonzales, Enrique Pedraza, Chesley Chappell, Magdaleno M. Chavez, Kennecott Copper Corporation, Santa Rita, New Mexico, 31 March 1954, folder 182, Fatal Accidents, NMSMIR, NMSRCA.
44. *Fifty-Eighth Annual Report of the State Inspector of Mines to the Governor of New Mexico*, 38.
45. "Bulletin," *Hobbs (N.Mex.) Daily News-Sun*, 4 January 1962; "Carlsbad Man Dies in Mine Accident," *Albuquerque (N.Mex.) Journal*, 26 June 1967; and "Mine Accident Kills One," *Roswell (N.Mex.) Daily Record*, 11 January 1987, 22. See also Folders 249 and 295, Fatal Accidents, NMSMIR, NMSRCA.
46. *Fifty-Eighth Annual Report of the State Inspector of Mines to the Governor of New Mexico*, 41.
47. "Mine Accident Proves Fatal," *Santa Fe New Mexican*, 28 December 1940; "Mine Victim's Condition Serious," *Albuquerque (N.Mex.) Journal*, 27 June 1973; and Sam

W. Jordan Jr., International Minerals and Chemical Corporation (IMCC) Carlsbad, New Mexico, 16 July 1949, folder 149, Fatal Accidents, NMSMIR, NMSRCA.

48. Andrew Hopkins, "For Whom Does Safety Pay? The Case of Major Accidents," *Safety Science* 32 (July 1999): 143–53; and Carol Sheppard, "Mine Accidents Incidence Goes Down but Costs Go Up," *American Mining Congress Journal* 69, no. 18 (1983): 20.
49. Oak Grove, Grant County, New Mexico, Federal Census, 1910, r. T624_915, microfilm (Washington, D.C.: GPO, 1913), *Thirteenth Census of the United States*, microcopy 1374928, and Silver City, Grant County, New Mexico, Federal Census, 1930, r. 1395, microfilm (Washington, D.C.: GPO, 1931), *Fifteenth Census of the United States*, microcopy 2341130, National Archives Microfilm Publications, Records of the Bureau of the Census, RG 29, National Archives, Washington, D.C. Federal censuses accessed through www.ancestry.com.
50. Arthur Stuart to Juan Chacon, 25 June 1962, folder 8, box 6, Local 890, Juan Chacon, President 1954–62, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.
51. Eve Simmons, "Grant County Loop," *Silver City (N.Mex.) Daily Press*, 14 July 1963.
52. Grant County Obituary Texts, www.rootsweb.ancestry.com/~nma/grant/grobittexts.htm (accessed 27 April 2011).
53. See, for example, the obituary of Nicolas Rosales, *Silver City (N.Mex.) Daily Press*, 18 February 1973; and obituary of Fidel Hinojosa, *Las Cruces (N.Mex.) Sun-News*, 17 September 1959.
54. Data aggregated from Fatal Accidents, NMSMIR, NMSRCA.
55. For the impact of particular technologies on the decline in mining fatalities more generally, see Paul H. Rakes, "West Virginia Coal Mine Fatalities: The Subculture of Danger and a Statistical Overview," *West Virginia History* 1 (spring 2008): 1–26.
56. Allen D. Look and M. L. Williams, "Safety Plan at Ray Mines Division," Information Circular 7772, Bureau of Mines, March 1957. See also Huggard and Humble, *Santa Rita*, 200–201.
57. "Heads, Eyes and Toes," Kennecott Copper Corporation, *Chinorama* (December 1958): 18, RGHC, NMSU.
58. "Sammy Safety's New Contest Can Mean Ham for Everybody!" Kennecott Copper Corporation, *Chinorama* 4 (July/August 1958): 5, RGHC, NMSU.
59. "Announcing Chino Safety Stock," Kennecott Copper Corporation, *Chinorama* 7 (May/June 1961): 10, RGHC, NMSU.
60. "Safety Contest Near End," Kennecott Copper Corporation, *Chinorama* 6 (January/February 1960): 11, RGHC, NMSU.
61. See, for example, "Chino Departments Win National Safety Awards," Kennecott Copper Corporation, *Chinorama* 2 (September 1956), RGHC, NMSU; "Chino Open Pit Mine Wins Top Safety Award," Kennecott Copper Corporation, *Chinorama* 16 (May/June 1970): 16, RGHC, NMSU; and *This is Chino*, folder 3, box 3, MS 166, Harold Cooley Papers, 1968–1971, RGHC, NMSU.
62. Eduardo Gonzales, Copper Flat Mine, Hanover, New Mexico, 13 March 1947, folder 123, Fatal Accidents, NMSMIR, NMSRCA.
63. Eduardo Gonzales, Copper Flat Mine, Hanover, New Mexico, 13 March 1947, folder 125, Fatal Accidents, NMSMIR, NMSRCA.

64. Florencio Eli Esquibel, Kearny Mine, Hanover, New Mexico, 29 August 1950, folder 161, Fatal Accidents, NMSMIR, NMSRCA.
65. Clay Moore, American Smelting and Refining Company, Vanadium, New Mexico, 9 September 1949, folder 153, Fatal Accidents, NMSMIR, NMSRCA.
66. Mine workers are responsible for the "timbering" of the mine—that is, the propping up of the roof with timbers, which look like railroad ties. By spending time timbering, workers are not mining the mineral or metal, so timbering is sometimes considered a "waste of time" even though it is necessary to make the workplace safe. Eventually there comes a point where the mine is so shored up that miners cannot blast any mineral out of it. Reynardo G. Mendoza, U.S. Smelting and Refining Company, Bayard, New Mexico, 20 November 1948, folder 138, Fatal Accidents, NMSMIR, NMSRCA.
67. Sam W. Jordan Jr., IMCC Carlsbad, New Mexico, 16 July 1949, folder 149, Fatal Accidents, NMSMIR, NMSRCA.
68. Carmen Garcia, Kearny Mine, Hanover, New Mexico, 21 February 1950, folder 151, Fatal Accidents, NMSMIR, NMSRCA.
69. Norman Prudent, Southwest Potash Corp., Carlsbad, New Mexico, 19 September 1952, folder 174, Fatal Accidents, NMSMIR, NMSRCA. Another possible explanation for the shift in attitude may be that mine inspector John A. Garcia had no direct ties to the New Mexico mining industry but was the son of John Garcia Sr., one of the partners in a top-ranking national mining consulting firm, Allen and Garcia, in Chicago. Inspector Garcia may have been more objective than some of the deputy mine inspectors who had close ties to the New Mexico mining industry from the outset.
70. Juan Placencio, New Mexico Consolidated Mining Company, Hanover, New Mexico, 21 November 1952, folder 175, Fatal Accidents, NMSMIR, NMSRCA.
71. Clyde Roberts, Potash Company of America, Carlsbad, New Mexico, 9 May 1953, folder 177, Fatal Accidents, NMSMIR, NMSRCA.
72. Fernando Chavez, Manganese Corporation of Arizona, Socorro, New Mexico, 1 June 1955, folder 185, Fatal Accidents, NMSMIR, NMSRCA.
73. Joe Cattaneo, U.S. Potash Co., Carlsbad, New Mexico, 24 May 1958, folder 203, Fatal Accidents, NMSMIR, NMSRCA.
74. For the statistical significance of the correlation between safety and unionization, see Karen Page, "Blood on the Coal: The Effect of Organizational Size and Differentiation on Coal Mine Accidents," *Journal of Safety Research* 40, no. 2 (2009): 85–95.
75. David Laurence, "Safety Rules and Regulations on Mine Sites: The Problem and a Solution," *Journal of Safety Research* 36 (January 2005): 39–50.
76. Minutes of Safety Committee Meeting, Peru Mine, 14 April 1964, folder 32, box 5, Local 890, America-Peru Mining Company, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.
77. Local 415 to Harry Shively, Safety Engineer of the Duval Sulphur and Potash Company, 14 January 1954; and Local 415 to Rex Seeley, Safety Engineer of IMCC, 4 January 1954, folder 96, Carlsbad Potash Workers Local 415, Correspondence, ser. 3, New Mexico State Mine Inspector Records, Collection No. 1965–002, New Mexico State Records Center and Archives, Santa Fe, New Mexico [hereafter Correspondence, NMSMIR, NMSRCA].

78. Mine-Mill Flyer, folder 96, Carlsbad Potash Workers Local 415, Correspondence, NMSMIR, NMSRCA.
79. Manrue A. Nelson, Southwest Potash Corp., Carlsbad, New Mexico, 17 August 1951, folder 167, Fatal Accidents, NMSMIR, NMSRCA; Ernie White, Potash Company of America, Carlsbad, New Mexico, 26 February 1974, folder 365, Fatal Accidents, NMSMIR, NMSRCA; and John Garcia to Gov. Edwin Mechem, 4 July 1958, folder 97, Governor of New Mexico, 1952–1962, Correspondence, NMSMIR, NMSRCA.
80. Pedro M. Peña, Kennecott Copper Corporation, Hurley, New Mexico, 15 February 1949, folder 143; and Jose Lopez, Groundhog Mine, Vanadium, New Mexico, 2 February 1951, folder 163, Fatal Accidents, NMSMIR, NMSRCA.
81. Report on Arbitration Cases, Kennecott Copper Corporation, *Chinorama* 2 (July 1956), RGHC, NMSU.
82. Saturnino Godoy, Kennecott Copper Corporation, Hurley, New Mexico, 6 June 1961, folder 244, Fatal Accidents, NMSMIR, NMSRCA.
83. *Salt of the Earth* (1954). Jack Cargill points out that in the actual strike, collar-to-collar pay rather than workplace safety was the issue at stake. See Cargill, "Empire and Opposition," 183–270.
84. E. N. Gibbs to John Garcia, 25 February 1952, 2 June 1953, 2 December 1953, 16 December 1953, folder 96, Carlsbad Potash Workers Local 415, Correspondence, NMSMIR, NMSRCA.
85. Sigmund Rogozinsi and Harold Courter to John Garcia, 24 April 1953, 12 September 1953, folder 98, United Mine Workers District 50; and C. L. Wolfe to John Garcia, 29 June 1955, folder 103, International Brotherhood of Electrical Workers, Correspondence, NMSMIR, NMSRCA.
86. The firm overseeing the construction was Dallas construction firm McKenzie and Whittle. "Inspector to File Charges as Result of Mine Accident," *Albuquerque (N.Mex.) Tribune*, 7 January 1956; "Safety Device Lack Blamed for Accident," *Clovis (N.Mex.) News-Journal*, 4 January 1956; and Folder 190, Fatal Accidents, NMSMIR, NMSRCA.
87. The general correlation between notable mine accidents and public calls for improvement is documented in Mark Aldrich, "Preventing 'the needless peril of the coal mine': The Bureau of Mines and the Campaign against Coal Mine Explosions, 1910–1940," *Technology and Culture* 36 (July 1997): 483–518.
88. "Carlsbad Seeks Mine Inspector," *Albuquerque (N.Mex.) Journal*, 15 January 1956; and "Group Supporting Demand for 3rd Mine Inspector," *Clovis (N.Mex.) News-Journal*, 15 January 1956.
89. "State Will Hire 2 Mine Inspectors," *Albuquerque (N.Mex.) Tribune*, 4 February 1956; and "Two New Mining Inspectors Given Board Approval," *Albuquerque (N.Mex.) Journal*, 4 February 1956.
90. "Mines in Which 13 Died Given 'Unsafe' Citations," *Albuquerque (N.Mex.) Journal*, 26 August 1960; and "Mechem says Burroughs' Mine Safety Move 'Late,'" *Albuquerque (N.Mex.) Journal*, 27 August 1960. On safety in uranium mines generally, see Eric Mogren, *Warm Sands: Uranium Mill Tailings Policy in the Atomic West* (Albuquerque: University of New Mexico Press, 2002); and Brugge et al., *Navajo People*.
91. "Mine Safety Group Named," *Albuquerque (N.Mex.) Journal*, 28 August 1960.
92. "The Mines Report," *Albuquerque (N.Mex.) Tribune*, 6 September 1960.

93. Bob Lawrence, "Labor Leaders Blast Mine Safety Code," *Albuquerque (N.Mex.) Tribune*, 12 September 1960; and Judith Brimberg, "Labor Group Hits at Mine Safety Code," *Albuquerque (N.Mex.) Journal*, 12 September 1960.
94. Patricia Bell Blawis, "Silver City Copper Miners Face Down the Company—and Win," *Daily Worker*, 28 June 1974.
95. "Zinc Mine Workers Go on Strike," *Hobbs (N.Mex.) Daily News-Sun*, 10 September 1975; and "ASARCO Workers on Strike," *Silver City (N.Mex.) Daily Press*, 9 September 1975.
96. "'Ambulance Strike' Continuing," *Silver City (N.Mex.) Daily Press*, 18 September 1975.
97. See William Hays to All Mine Inspectors, n.d., folder 16, box 26, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
98. Arthur Stuart to A. O. Abalos, 30 June 1962, folder 38, box 5, Local 890, General Correspondence, 1954–66, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.
99. John Clark to Officers and Stewards, 26 July 1962, folder 12, box 2, Executive Committee, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM; and "Mine Safety," folder 17, box 1, MS 386, Torrez Papers, RGHC, NMSU.
100. *Address from the New Mexico Mining Association to the Subcommittee on Labor*, 4 May 1965, folder 5, box 225, Legislative, Interior, Safety Legislation and Mining, 1965, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
101. New Mexico Mining Association to Stewart Udall, 28 November 1962, folder 16, box 37, Interior, Indian Affairs, Bureau of Mines, 1962–64, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
102. Arthur Stuart to A. C. Montoya, 1 May 1962, folder 29, box 5, Local 890, A. C. Montoya Correspondence, 1954–63, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.
103. See M. R. Barraza to all International Representatives, Local Presidents and Secretaries, memo, "Mine Safety and Early Retirement," 13 April 1962, folder 22, box 4, M. R. Barazza, Executive Board Member, 1955–61; and Arthur Stuart to Alfredo Montoya, 17 July 1962, folder 29, box 5, Local 890, A. C. Montoya Correspondence, 1954–63, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.
104. Telegram to Joseph Montoya, 24 April 1962, folder 16, box 37, Interior, Indian Affairs, Bureau of Mines, 1962–64, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
105. The Udall report is summarized in *A Federal Mine Safety Law Now!* (Denver, Colo.: International Union of Mine, Mill and Smelter Workers, 1963).
106. A. C. Skinner to All Local Unions, 7 August 1963, folder 12, box 2, Executive Committee Correspondence with Local Unions, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM. See also "A Bill to provide health and safety regulations and proper enforcement thereof," S. 1949, 88th Cong. (1963–1965).
107. Irving Dichter, "Mine-Mill Legislative Action Letter," 21 July 1965, folder 12, box 2, Executive Committee Correspondence with Local Unions, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.
108. M. R. Barraza to all union presidents, 5 April 1966, folder 22, box 4, Maclovio Barazza, Executive Board, 1955–61, Alfredo Chavez Montoya Papers, 1930–1995, MSS 676 BC, CSWR, UNM.

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110. The Federal Metal and Nonmetallic Mine Safety Act of 1966, Pub. L. No. 89–577, 80 Stat. 772.
111. Rogers to Sen. Joseph Montoya (D-NM), 20 March 1969, folder 9, box 226, Department of the Interior, Bureau of Mines, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
112. Senators Frank Moss, Gale McGee, Joseph Montoya, and Lee Metcalf to Walter Hickel, 26 May 1969, folder 9, box 106, Agency, Bureau of Mines, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
113. W. Dan Walker Jr. to Sen. Joseph Montoya, 22 July 1969, folder 9, box 106, Agency, Bureau of Mines, Joseph M. Montoya Papers, 1913–1977, MSS 386 BC, CSWR, UNM.
114. "New Safety Rules at Carlsbad Mine," *Albuquerque (N.Mex.) Tribune*, 3 May 1968.
115. William Hays to Elmer J. Holland, 4 May 1968, folder 12572, State Inspector of Mines, 1965, Agencies, Boards and Commissions, ser. 5, Gov. Jack M. Campbell Papers, 1936–1967, Collection No. 1959–242, New Mexico State Records Center and Archives, Santa Fe, New Mexico.
116. Michael L. Kass, "A History of the U.S. Bureau of Mines, with Some Highlights of Its Involvement in Anthracite Mining," *Mining History Journal* 13 (2006): 73–92.
117. For example, see Vladislav Keojevic, Dragan Komljenovic, William Groves, and Mark Radomsky, "An Analysis of Equipment-Related Fatal Accidents in U.S. Mining Operations, 1995–2005," *Safety Science* 45 (October 2007): 864–74.
118. Todd Ruff, Patrick Coleman, and Laura Martini, "Machine-related Injuries in the U.S. Mining Industry and Priorities for Safety Research," *International Journal of Injury Control and Safety Promotion* 18 (March 2011): 11–20.
119. Jessica Patterson and Scott A. Shappel, "Operator Error and System Deficiencies; Analysis of 508 Mining Incidents and Accidents from Queensland, Australia, using HFACS," *Accident Analysis and Prevention* 42 (November 2010): 1379–85.
120. "Widow Faults Phelps-Dodge," *Albuquerque (N.Mex.) Journal*, 24 December 1998.
121. *Michelle Delgado*, 131 N.Mex. at 281.