AMERICAN INDIAN CULTURE AND RESEARCH JOURNAL 20:2 (1996) 173–185

COMMENTARY

Uranium Is in My Body

RACHEL L. SPIELDOCH

The Navajo people perceive the world as an interconnected whole. This applies to religion, concepts of health, and their view of themselves in relation to the world. In effect, a disruption in one part of their lives creates a disharmony in the overall system. This disruption not only creates stress on the individual but threatens the Navajo fabric of life.

In the late 1940s and 1950s the Navajo fabric of life was disturbed by the ill effects of uranium mining. With the rise of the Cold War, the United States government opened uranium mines in the Four Corners area of the Navajo Nation and remained the sole purchaser of uranium for defense purposes from the late 1940s to the early 1960s. During this period, the government offered higher paying jobs to local Navajo people in return for uranium. The Navajo were unaware of the dangers associated with uranium mining and radon daughters. In contrast, the federal government was hardly naive about the situation when it allowed thousands of Navajo people to face hazards to their health and their lives in the pursuit of the rich resources underneath reservation lands. The hazardous conditions in the mines eventually led to lung cancer and respiratory diseases that cause severe disability or death.

Rachel L. Spieldoch is a student at the University of Wisconsin, Madison, majoring in molecular biology and biochemistry.

Navajo people were sacrificed for economic growth. Many early uranium miners died without compensation as a direct result of radiation exposure. The government viewed these people as expendable. Currently, almost fifty years later, widows and surviving miners are still fighting for compensation. The United States government, which has a trust responsibility to Native Americans, ignored its duty to warn and protect the Navajo uranium miners from hazards. This experience reminds the Navajo people that terms such as *deculturation, ethnocide, termination,* and the *Vanishing American* are not dead concepts.

"I wonder if the ground has anything to say?... The Great Spirit in placing men on earth, desired them to take good care of the ground and to do each other no harm,"[1] says one Navajo tribal member. In 1947, Navajo miners entered the black holes blasted into the earth in search of uranium. These mines lacked proper ventilation, light, and water supplies. In fact, many Navajo workers quenched their thirst in these mines by drinking from "hot" puddles on the mine floor. They ate their lunches in the dust-filled mines and brought their work clothes home to be washed with their families' laundry. Houses were built from radioactive materials. The workers' children often played in the uranium tailings. In a study conducted by Susan Dawson with the Department of Sociology, Social Work and Anthropology at Utah State University, forty-eight Navajo people who had worked in uranium mines for an average of thirteen years reported that at no time were they informed of the dangers of radiation.[2] These early uranium miners, their wives, and their children were all exposed to radiation.

Perhaps the company best known for neglect of uranium miners was Kerr McGee Corporation. Spurred by the advice of the Bureau of Indian Affairs and the promise of higher wages, the Navajo Tribal Council approved an agreement with the Kerr McGee Corporation in 1952. Although wages averaged $1.60 per hour, two-thirds of the off-reservation rate for miners, it was a substantial amount for Navajo people, and they grabbed at this improved financial opportunity for their families. In addition, royalties were not a consideration; the agreement provided only for flat rates.

In 1952, a federal mine inspector reported that the mine's ventilation system was not in operation. The inspector returned in both 1954 and 1955 and reported similar conditions: The fans and ventilation blowers were not working adequately to provide a

safe environment for miners. In 1959, the radiation levels in the Kerr McGee shaft allegedly had reached ninety times the "permissible" limit.[3] More than seventy-one acres of uranium tailings were abandoned at the mining site in early 1980. Uranium has a half-life of 4.5 billion years.[4] However, it is not the uranium itself that is most dangerous but the radon daughters, which result from uranium decay and actually have a much shorter half-life, approximately thirty minutes. The radon daughters quickly become attached to solid surfaces such as dust particles and are ingested by the miners and others in the vicinity of the contaminated areas. Once ingested, the particles are internalized and delivered to the lungs.

Although the situation with Kerr McGee in Shiprock, New Mexico, exemplifies abusive and inhumane treatment of Navajo people, this experience does not stand alone. Unfortunately, the atrocities at Shiprock represent common treatment for the majority of Navajo uranium miners during this time in history. Maltreatment in uranium mines was not well publicized because the mines were primarily controlled by the federal government, which did not want to bear the burden of public scrutiny.

During the late 1940s and the 1950s, uranium was sought more than all other metallic minerals combined. Uranium mining promised billions of dollars for the federal government and the national economy. Not only did the government effectively own all uranium for most of the period between 1947 and 1971, but it aggressively encouraged production during this time. On the Navajo Reservation, the government demonstrated indifference toward its 1868 treaty with the Navajo Nation by failing to protect the people from life-threatening conditions in and near the mines. Enormous quantities of uranium tailings were negligently dumped into local water tributaries used by the Navajo, their livestock, and the people in neighboring communities. Uranium was abandoned in piles near mine sites, left ripped from the earth in "National Sacrifice Areas"[5] not fit for human sustenance. The Navajo people were faced with the destruction of their land, the poisoning of their bodies, and the unraveling of their religious fiber. As one Navajo stated, "There is no center anymore, the sacred tree is gone."[6] The facts are embarrassing for the United States government. Safety standards were not implemented until 1971, thirty-five years after the initiation of uranium mining, despite already published literature concerning the effects of radiation on human lives.

As early as the mid 1500s, miners of uranium-bearing ores in the Erz Mountains of east-central Europe were reported to have an unusually high frequency of lung disease, which became known as "bergkrankheit," meaning mountain sickness. In 1913, Arnstein reported that of 665 Schneeberg uranium miners, 40 percent died of lung cancer. In 1932, Pirchan and Sikl reported that 53 percent of uranium miners in Joachimsthal Czechoslovakia between 1929 and 1930 had died of lung cancer.[7] By the 1940s, the hazards associated with uranium mining were well accepted by the scientific community. Nevertheless, uranium mining began in the Four Corners region of the United States.

Once the uranium mining was well underway in 1949, the United States Public Health Service (PHS) conducted a study to assess the risks to uranium miners. For the first time, researchers could isolate uranium as the sole cause of illness, without cigarette smoking as a limiting factor. The majority of Navajo people did not smoke, and as a population they had demonstrated a low frequency of lung cancer prior to this time. This study clearly indicated that the miners were exposed to extremely high levels of radiation and silicate dust. By 1951, the PHS and the Atomic Energy Commission (AEC) realized that mechanical ventilation to remove the dust concentration in mines could greatly reduce health hazards. The results of the study also showed that incidence of lung cancer was much higher than expected. In 1957, the U.S. Public Health Service proposed "1 Working Level"[8] as the standard for control of radon daughter exposure, and this standard was adopted by the American Standards Association in 1960.[9] However, the lack of attention to these standards became a mockery to all of the uranium miners who died. In fact, the PHS announced at this time that it still had insufficient knowledge to establish exposure standards. By 1962, 68 percent of uranium mines were found in excess of the recommended level. During the mid-1960s, ventilation surveys showed that many uranium mines were still relying on natural draft pressure or nonfunctional mechanical ventilation systems with inoperative blowers for ventilation. Four years later, only 44 percent of uranium mines in the United States had reduced radiation levels to the recommended limit.[10] During this time, new activist groups such as NIOSH, MESHA, and MESCA expressed Navajo discontent and supported the implementation of safer work environments and compensation for uranium miners.

One of the most documented epidemiologists on this topic, V.E. Archer, reported in 1964 both a significant excess of lung cancer mortality and an increase in debilitating respiratory diseases such as pulmonary emphysema, fibrosis, and chronic bronchitis. In 1967, F.E. Lundin discovered sixty-two deaths related to lung cancer among white underground uranium miners in contrast with 10.02 expected.[11] He and Archer concluded that an exposure of 120 Working Level Months (WLM) appeared to double the normal lung cancer incidence among uranium miners. Shockingly, the WLM of early uranium miners was frequently above 1,000 WLM and could reach as high as 3,000–4,000 WLM.

As research advanced, it was found that lung cancer associated with radioactive exposure is often the small, undifferentiated cell type. In the late 1960s and early 1970s, a scientist named Saccomanno reported an association between radon daughter exposure and increased incidence of bronchogenic tumors of small cell undifferentiated histology among miners with WLM as low as 40–200.[12] In a demonstration of how drastically political attitudes contradicted scientific facts, the Federal Radiation Council concluded in 1967 that "the data is not sufficient to indicate an association between exposure to radon daughters and the subsequent development of lung cancer when cumulative exposures are less than 1000 WLM."[13] Finally in 1971, the U.S. Department of the Interior declared four WLM as the standard exposure to radon daughters. This standard assumed that a thirty-year exposure would yield an upper danger limit of 120 WLM, thus *only* doubling the risk for lung cancer. Dr. Hornung, chief of the Statistical Services Section at the National Institute for Occupational Safety and Health in Ohio, stated during the 1990 congressional hearings that "*no* totally safe level of radon exposure is assumed. Each additional WLM of exposure above naturally occurring background will produce an increment in lung cancer risk. Therefore, one must speak in terms of acceptable risk rather than a totally safe level of exposure."[14]

The message conveyed is that the federal government, in an effort to benefit economically, intentionally neglected its responsibility to educate Navajo Indians about the health and safety hazards associated with uranium mining. The federal government, the Public Health Service, and the Atomic Energy Commission would have to have been completely uneducated about the situation in order to have possessed a legitimate lack of awareness of the potential dangers. Traditional Navajo people believe that

material wealth is an indication of false status; in this situation, the opposite seems true for the United States government.

Prior to the Congressional hearing in 1990, compensation for uranium miners was nonexistent unless the worker contracted the disease while actively working in the mines. For example, New Mexico has several provisions that clearly make it difficult or impossible for early uranium miners to receive compensation. First, a claim cannot be filed unless a written notice was given to the employer within thirty days of the onset of illness. For many miners, this deadline was passed before they became aware of theirentitlements. Second, a claim must be filed within one year of the onset of illness. Many individuals found it very difficult, if not impossible, to collect all the necessary paperwork and records to file a claim by the deadline. The businesses were shut down years ago, and the names of employers and managers have been forgotten. Third, countless miners contracted cancer or respiratory disease ten or more years after working in the mines, but there is no compensation for illnesses that develop so long after the miner last worked. Although these provisions are specific to New Mexico, similar problems arise with the compensation laws for early uranium miners in other states of the Four Corners Region prior to 1990.

In the fall of 1990, Congress passed the Radiation Exposure Compensation Act. Forty-three years had passed since the uranium miners' first exposure to radiation. The majority of people instrumental to the reasoning behind this act are no longer alive. Their medical records are gone, their families are gone, their land is destroyed. These people cannot be compensated for their losses. Although a proposal for this act was first presented in 1979, eleven years passed before the law was passed. Under the law, miners or their beneficiaries are entitled to $100,000 in compensation if they (1) worked in the uranium mines in New Mexico, Arizona, Colorado, or Utah between 1947 and 1971, (2) were exposed to two hundred or more WLM of radiation, and (3) contracted lung cancer or another serious disease. An afflicted miner who worked for three years or more in one or more uranium mines prior to federal standards in 1971 is potentially eligible for benefits under this act. The eligible survivors of each miner are entitled to the benefits unless it is established that, at the time of death, such miner was not partially or totally disabled due to radiation-induced or dust-induced latent disease.[15]

The Radiation Exposure Compensation Act makes an important statement in history. The federal government offered a public apology for the maltreatment of early uranium miners. However, after the law passed through the Department of Justice, the ideology behind compensation was lost as fraud against the federal government became a basis for political paranoia. The original congressional intentions for the act were greatly misinterpreted during implementation. As a result, strict rules and regulations disqualified many uranium miners.

In an inspection report, the U.S. Department of Justice wrote that, between April 1992 and March 1993, the unit received 2,634 compensation claims. Out of all of these, only 585 claims were approved. Two hundred sixty-two claims were denied and 1,787 claims were left pending.[16] Although the Radiation Exposure Compensation Act was a move in the right direction, it contained numerous deficiencies and left many problems unresolved. For example, the act does not cover families that lived near the mining area but whose members were not miners. Just like the miners, these people ingested the dust-filled air, their children played in the uranium tailings, and their homes were built from radioactive materials. In addition, when the mechanical ventilation systems were finally implemented, they were not engineered to protect surrounding communities. The dust that was blown out of the mines to improve the safety of the workers was diffused into the air of the nearby community.

Perhaps an even larger concern is that compensation has not been provided for uranium millers, who were exposed to uranium in many different stages of development. At the mills, uranium oxide (U_3O_8) was stockpiled, crushed, sampled, ground, and leached to extract the uranium.[17] The final concentrate, often termed *yellow-cake,* remained on the clothing, hands, and hair when the workers went home. The government has not provided compensation to these workers because it claims that not enough studies have been completed concerning hazards to millers. Past studies should be sufficient evidence that radiation, in any form, is extremely hazardous.

Although many early uranium miners have been diagnosed with specific work-induced diseases such as silicosis, they are not eligible for compensation because they are not disabled. If the government accepts its responsibility for having caused illness in a certain group of people, then it should also provide benefits to individuals with medically related ailments who are not necessarily disabled.

Finally, the federal government made the mistake of relating nonrespiratory diseases such as fibrosis and silicosis to radiation exposure. According to Dr. Samet, an expert on pulmonary medicine at the University of New Mexico, "nonrespiratory disease linked to radiation exposure is medically inappropriate. Silica causes silicosis; radon exposure does not cause silicosis."[18] It seems apparent that there were no doctors around when the compensation act was written. Silicosis, fibrosis, and other dust-induced respiratory diseases are not connected to radiation. Therefore, the compensation act should not use radiation exposure levels to determine benefits for workers with nonmalignant respiratory diseases.

Passage of the Radiation Exposure Compensation Act implies that the federal government sympathizes to some degree with early Navajo uranium miners and is willing to compensate them for their suffering. However, along with complications and exclusions in the actual wording of the act, interpretation and implementation have become another political mess that delays and negates compensation. The intent of the act has been twisted and made so stringent that many Navajo people are having difficulty applying for benefits. According to Dr. Abel, head of the Indian Health Service's pulmonary clinic, "one miner had a cardiac arrest in our office. Ironically, he was coming in for paperwork. Paperwork seems to be more of a problem than anything else."[19] The three areas of greatest conflict in interpreting and implementing the act are records, medical supplies, and regulations.

According to the law, each claimant must present a complete medical history in order to receive compensation. Unfortunately, almost fifty years after the Navajo miners were poisoned with illness-causing substances and radiation, the medical and work records of many of these individuals remain lost or incomplete. It seems ironic to disqualify someone from receiving compensation because the federal Indian Health Service cannot find the correct documents. The National Institute of Occupational Safety and Health, which was responsible for keeping lists of all mine workers, also has incomplete records.

Adding to the confusion is the fact that physicians often have misdiagnosed the miners' illnesses. Proper medical facilities for correctly diagnosing mine-related diseases often are not available. Tests such as MRI for detecting fibrosis and Beta reading tests for detecting silicosis are extremely expensive and are not available on or near the reservation. Without MRI, silicosis and

fibrosis are difficult and sometimes impossible to distinguish. Apparently, several miners traveled to the Mayo Clinic in Minnesota to have MRIs done for their compensation paperwork. Unfortunately, even after all this energy is expended on paperwork, chances remain slim that compensation will be received.

The government will not budge to help these Navajo people when records or medical tests are not available. To simplify the compensation process, the act ought to eliminate the required diagnostic distinction between silicosis, fibrosis, and pneumoconioses and instead should define nonmalignant respiratory disease as "any occupationally caused restrictive respiratory disease."[20] In this manner, the benefit of the doubt would be given to the Navajo people.

Most important, regulations mandated by the Department of Justice now have superseded the original agreement passed by Congress. In order to receive compensation for nonmalignant respiratory diseases such as silicosis or pneumoconioses, the miners are required to have accumulated all of their exposure on the reservation. This regulation was derived from the direct passage in the act that "miners with silicosis must work on the reservation."[21] Although this passage does not necessarily imply that all mining must be performed on the reservation, Navajo individuals who ingested less than the required number of WLM on the reservation but accumulated more than the requirement at several mines both on and off the reservation are ineligible for compensation. In addition, the required radiation exposure standard for compensation is two hundred WLM. As mentioned earlier, after thirty years in a uranium mine with an average exposure of four WLM per year, the worker will have accumulated 120 WLM, which more than doubles his risk of lung cancer. The 200 WLM requirement is extremely high and prevents many sick people from qualifying for benefits.

Finally, although attitudes toward smoking are largely negative today, smoking was hardly uncommon in the 1940s and 1950s. For the Navajo uranium miners who smoked, the risk of lung cancer from a combination of radon daughter exposure and cigarette smoking is multiplicative. However, under the Radiation Exposure Compensation Act, Navajo uranium miners who smoked are required to have a higher level of radon daughter exposure, and thus a higher risk of cancer, before becoming eligible for compensation. Further, a man who smoked three packs a day for thirty years and a man who smoked one pack a day

for one year are both considered smokers by law and are subject to the same compensation limits.[22]

Although lost or incomplete medical records, inadequate medical facilities, and ambiguous regulations are the most blatant obstacles to compensation in the current legislation, the number of complications becomes almost infinite when each claimant's situation poses a different set of problems. Additional complications arise from the required certification of medical records and a thirty-day deadline for returning requested documents. Spousal compensation can be complicated by the fact that many Navajo couples had traditional marriage ceremonies, which are not regarded as legitimate by the federal government.

Uranium mining in the 1940s and 1950s had a terrible effect on the water resources, the usable land, and the lives of the people. Already many of the miners' children have developed cancers at a young age. Today the Navajo must choose between death from hazardous exposure or deculturation through relocation. Many are uneducated and unaccustomed to life outside the reservation. They do not know how to survive in an urban environment. If they leave their land and are forced into an economic and social structure incompatible with their own, the religious threads of their lives are broken and their culture shatters: "The creator has planted me here on this earth. This is all one body—humans, geese, animals, grasses, rain. My roots go way down deep and can't be pulled out. If we relocate, we sell our prayers and that will be the end of us."[23] The International Convention on Suppression and Punishment of the Crime of Apartheid prohibits "deliberate imposition on a racial group or groups of living conditions calculated to cause its or their destruction as a whole."[24]

According to Mark Zannis and Robert Davis, "the welfare system is a form of pacification. Combined with political and physical repression, it keeps people alive at a subsistence level but blunts any attempt at revolt while turning them into captive consumers of industrial products."[25] Continuing government handouts can only promise a bleak future for Native American culture. Past efforts by the government to deal with the "Indian situation" suggest that self-sufficiency is not acceptable without assimilation. Historically, the federal government has attempted to contain and stifle Indian livelihood in order to maintain control over government-to-government relations. Federal documents suggest a weaker sovereign accepting the protection of a stronger sovereign without extinguishing its own sovereignty. In reality,

however, the incidents surrounding uranium mining on Indian lands reveal a weaker government exploiting its resources and labor in an effort to survive economically. From this perspective, mining developers view Native American values as an obstacle to be overcome.

Almost half a century ago, uranium miners stole from the earth's core for the economic benefit of the federal government. Fifty years later, many of these individuals are dead, but the consequences of the experience are still being felt by the survivors. One scholar regards the trust relationship between Native Americans and the federal government as "racial discrimination and unfettered U.S. power disguised as moral duty."[26] Ronald Reagan's statement in 1988 that "maybe we should not have humored Indians in their primitive lifestyle—maybe they should have been made citizens like everyone else,"[27] proves that ignorance about Indian history still thrives in our society. Some people—people with political power—still regard the concepts of termination and ethnocide as viable despite the struggles of Native Americans for their rights. Native Americans must become educated about energy politics so that they can protect themselves in the future.

Native Americans are not going to vanish. Although the losses to Navajo land and resources resulting from uranium mining cannot be recovered, recognition and respect as a sovereign nation should be attainable. A gap of understanding exists between Native Americans and the United States government. If this gap continues to grow, the deaths of early uranium miners will have been in vain, and the lessons of history will be left untold. While Native Americans must continue to fight for self-determination and the preservation of their culture, the U.S. government also must strive to recognize and protect Native American rights. Both parties must work together for a better future for Native Americans and for the enrichment of all people.

NOTES

1. Todd Howland, "U.S. Law as a Tool of Forced Social Change: A Contextual Examination of the Human Rights Violations by the United States Government against Native Americans Big Mountain," *Boston College Third World Law Journal* 7 (1987): 61–96.

2. U.S. Senate, Committee on Energy and Natural Resources, Subcommittee on Mineral Resources Development and Production, "Impacts of Past

Uranium Mining Practices: Hearing, March 13, 1990," *One Hundred First Congress: Second Session on the Impacts of Past uranium Mining Practices: Shiprock, NM, 101-683* (Washington DC: U.S. Government Printing Office, 1990), 147.

3. M. Annette Jaimes, *The State of Native America: Genocide, Colonization, and Resistance* (Boston: South End Press, 1992), 247.

4. J.K. Wagoner, "Uranium: The United States Experience, A Lesson in History," *Exhibit 1: One Hundred First Congress*, 84.

5. Jaimes, *The State of Native America*, 253.

6. A Navajo made this statement in the 1985 film documentary *Broken Rainbow*, 70 min., Earthworks, 1985.

7. Wagoner, "Uranium: The United States Experience," 1.

8. One Working Level (WL) is equal to any combination of radon progeny in 1 liter of air that results in the release of 1.3×10^5 MeV of potential alpha energy. R.J. Roscoe et al., "Mortality among Navajo Uranium Miners," *American Journal of Public Health* 85:4 (1995): 535–40.

9. U.S. Senate, *One Hundred First Congress*, 9–11.

10. Ibid., 62.

11. F.E. Lundin, Jr. et al., "Mortality of Uranium Miners in Relation to Radiation Exposure, Hard Rock Mining and Cigarette Smoking: 1950–September, 1967," *Health Physics* 16 (1969): 571–78.

12. Wagoner, "Uranium: The United States Experience," 75.

13. Federal Radiation Council, "Report No. 8 Revised, Guideline for the Control of Radiation Hazards in Uranium Mining," *Staff Report of the Federal Radiation Council* (September 1967), 20.

14. U.S. Senate, *One Hundred First Congress*, 23.

15. U.S. Senate, Committee on Labor and Human Resources, "Oversight of the Radiation Exposure Compensation Act: Hearing, June 5, 1993," *One Hundred Third Congress: First Session on the Oversight of the Radiation Exposure Compensation Act: Shiprock, NM, 103-619* (Washington DC: U.S. Government Printing Office, 1993), 4. *Radiation-induced disease* includes lung cancer, bronchogenic cancer, cancers involving the respiratory or the lymphopoietic system, and any other disease that the secretary concludes is radiation-induced. The term *dust-induced latent disease* includes pulmonary fibrosis, silicosis, corpulmonale, and any other disease resulting from employment as a uranium miner. U.S. Congress, *Congressional Record: Proceedings and Debates of the 96th Congress, First Session September 27, 1979* (Washington DC: U.S. Government Printing Office, 1979), 134.

16. Ibid., 74.

17. U.S. Senate, *One Hundred First Congress*, 79–80.

18. U.S. Senate, *One Hundred Third Congress*, 19.

19. Ibid., 14.

20. Ibid., 7.

21. Ibid., 16.

22. Ibid., 12.

23. Trebbe Johnson, " Indian Wars in the Nuclear Age: The Navajo-Hopi Land Dispute," *Amicus Journal* 8 (1986): 23.

24. Howland, "U.S. Law as a Tool of Forced Social Change," 81.
25. Jaimes, *The State of Native America*, 245.
26. Howland, "U.S. Law as a Tool of Forced Social Change," 78.
27. President Ronald Reagan made this statement during his 1988 visit to the former Soviet Union (*Frontline*, Boston, WGBH, 58 min., 1988).