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By Arjun Makhijani

On September 29, 1957, at 4:20 p.m., an enormous explosion in a tank containing highly radioactive waste occurred in the Mayak nuclear weapons plant in the southern Ural mountains of the Soviet Union. The fallout plume spread strontium-90 and other dangerous radionuclides over about15,000 square kilometers, which remain contaminated to this day.
Food stores were closed, and more than 1,000 tons of food dumped. Farming was stopped for more than two decades on about 150,000 acres. More than 10,000 people were relocated, and their empty homes were torn down and buried as radioactive waste. Yet, none of the residents were told why. The Soviet government covered up the accident, only acknowledging the devastation in June 1989 as the Cold War was ending.[1]

Surprisingly, the West assisted the Soviet government in its cover-up. In 1976, Soviet dissident biologist Zhores Medvedev published an article in the New Scientist, a British science magazine, about the accident. Instead of denouncing the callous cover-up of the Soviets, however, the chairman of the United Kingdom Atomic Energy Authority, Sir John Hill, and other British experts dismissed the story as “rubbish” and “scientific fiction.”[2]

The CIA also helped the cover-up. According to a 1959 CIA document, the agency knew that an accident had occurred that resulted in food stores being closed. The resulting food shortages created lines that were “reminiscent of the worst shortages during World War II.” They also knew that high officials had been “wearing small radiation counters” while the public had no protection.

Yet, the CIA did not publicize the accident, even though it occurred during the height of the Cold War and at a time that both sides took every opportunity for propaganda advantage. The U.S. government did not condemn the Soviets for the secrecy and destruction of homes without informed consent. Was it because officials in the West feared that the public might raise questions about the possibility of a similar explosion in France, the United Kingdom, or the United States?

Indeed, since the dawn of the atomic age, millions of people in other parts of the world have been affected by bomb production and testing. American, British, French, and Soviet soldiers were ordered to participate in atomic war exercises. Children in the United States have seen their risk of cancers rise from drinking milk contaminated with fallout from atmospheric nuclear tests. Conditions for uranium miners in India are lamentable, and who knows what damage has been caused by nuclear weapons in China, Israel, North Korea, and Pakistan?

Few nuclear-weapon states have provided much information about the harm caused by their nuclear weapons establishments. For example, information about the intense fallout from French nuclear tests in Polynesia is coming to light only this year. The typical reaction of these establishments has been to deny damage, cover up problems, and simply assert national security requirements to be taken on trust, promulgated by fiat, or both.

The problem is by no means at an end, even leaving aside plans in the United States and other nuclear-weapon states to make more nuclear weapons. For example, poor radioactive waste disposal practices throughout the Cold War threaten some of the most important water resources in the United States. These include putting high-level liquid radioactive wastes from reprocessing into tanks that have leaked a million gallons into the ground near the Columbia River and dumping plutonium-laden wastes into unlined pits above Snake River Plain Aquifer, southeastern Idaho’s sole source aquifer.

Avoiding and Permitting Fallout

Efforts to keep damaging information about nuclear weapons hidden from the public began early. The very first nuclear test on July 16, 1945, led to severe fallout and hot spots of radioactive contamination 32 kilometers from the site. The affected people were not informed even after the bombings of Hiroshima and Nagasaki, nor were they evacuated. A fallout cloud hung over much of southeastern New Mexico in the days following the test, but even 60 years later, there has been no official investigation of the health effects. Col. Stafford Warren, a medical doctor in the Army who was the chief of radiation safety for the test, recommended that future tests should not be done within 240 kilometers of human habitation. The recommendation was ignored, with tragic effects.

In 1950, the United States had considered setting up a weapons testing site in North Carolina at a coastal location that would have allowed most fallout to land in the ocean. Instead, the United States chose to set up a continental nuclear weapons test site in Nevada with the knowledge that a western location would blow fallout over most of the country. The federal government risked the health of its citizens in large part to make life more convenient for weapons scientists at New Mexico’s Los Alamos National Laboratory and to avoid the political difficulties

of acquiring coastal private property through eminent domain.

When the site became operational, tests were conducted when the wind blew away from Las Vegas and Los Angeles. The result was ubiquitous fallout over most of the rest of the continental United States. The government reassured a skeptical public that it would provide ample warning of any dangers. Yet, it did not share the results of its 1950 research, which had shown that milk would be contaminated by fallout. Cows would eat grass on which iodine-131, an intensely radioactive fission product, had been deposited. The iodine-131 would concentrate in the milk. Growing children who drank the milk would get large doses of radiation to their thyroids, creating a risk of cancer and other thyroid diseases.[3]

Rather than address these realistic concerns, the military dismissed them. The opinion in military circles was that the public in the United States had a "hysterical and alarmist complex" about radiation that needed to be corrected to enable the United States to proceed with its testing activities. In internal documents, Department of Defense officials said the process of correction "would be a matter of reeducation over a long period of time." The objective was in direct contradiction to the advice given by Warren in July 1945: the "reeducation" was supposed to go on until "the public will accept the possibility of an atomic explosion within a hundred or so miles of their homes." At that point, the establishment of a test site in the continental United States would no longer be a problem. [4] People would then "feel at home with neutrons trotting around" and presumably become comfortable with nuclear tests nearby. It was after all, as the safety preparations were being done in December 1950, "the most important angle to get across."[5]

The cover-up was a spectacular success, although the fallout was intense. After two nuclear tests (Shot Harry and Shot Nancy), 1,420 lambing ewes and 2,970 lambs in Nevada, Utah, and Arizona died of severe radiation injuries.[6] In the lawsuit that followed,[7] the government's representatives provided what the judge nearly 30 years later concluded was "false and deceptive" representations, withheld information, and provided other information "in such a manner as to be deceitful" and, in sum, "manipulated" the court by "convoluted actions."

In 1997, when the National Cancer Institute acting under congressional directive assessed milk contamination, it found that fallout from the tests would eventually cause between 11,000 and 212,000 thyroid cancers. The cancer risk fell primarily to those who had been children, with girls being at twice the risk of boys. A large portion of the milk supply of the continental United States had been poisoned with iodine-131, with no action being taken to protect it. Those who believed that they were leading healthy farm lives by drinking fresh milk got the highest doses.

An atomic Kodak moment was playing out in a parallel political and economic universe in the very same period. The photographic film company found its film was getting fogged because the corn husks it was using to make packaging had become contaminated with fallout. Kodak threatened to sue. The government quickly provided data on anticipated patterns of fallout to Kodak and the rest of the photographic film industry so they could protect their products.[8] Was it because Kodak knew too much? Was it because film was more precious than milk?

As a way to avoid publicity and lessen the political consequences, the United States and other countries also often tested weapons in areas home to foreign subjects or minority populations. The United States located its test sites in the Marshall Islands and on land claimed by the Western Shoshones in Nevada. The Soviets located their major test site in the land of the Kazakhs, near Semipalatinsk. The British conducted their tests on native lands in Australia and on Christmas Island in the Pacific. The Chinese located theirs on minority lands in western China. The French test sites were in the colonies in Algeria and Polynesia.

According to France's conservative newspaper, Le Figaro, although fallout was anticipated and the genetic risk for the native population was considered greater than that for the general French public, "a preventive relocation of the people of the Gambiers [archipelago] was ruled out for political and psychological reasons." Further, the evacuation of old people and children "who comprised a large fraction" of the population was considered "the most difficult," so they were left in the path of the fallout.[9]

To be sure, the cover-ups were not entirely successful. Public protests in the 1950s and concerns about contamination of mother's milk and baby's teeth with strontium-90 were central to the Partial Test Ban Treaty, which the Soviet Union, United Kingdom, and the United States signed in 1963. In a real, practical sense, the first arms control treaty was an environmental one. Yet, China and France did not sign. The French did not stop atmospheric testing until 1974; the Chinese did so in 1980.
Moving tests underground did not end the problem, even though it did greatly mitigate the problem of radiation doses from short-lived radionuclides such as iodine-131. Large amounts of plutonium, iodine-129, cesium-135, and other long-lived radionuclides remain underground at the test sites. They possess the potential for migration into water bodies in the long term. No cleanup method has yet been devised.

The frequent claims of safety and lack of deleterious health effects of nuclear tests are perhaps most clearly contradicted by military plans to use fallout as a terror weapon. The fallout from the first ever underwater test at Bikini in July 1946 was so ubiquitous and so insidious in its effects that the Joint Chiefs of Staff evaluation of the military aspects of the tests concluded that fallout may constitute a weapon of war. Of the long-term effects of the radioactivity, the 1947 evaluation stated that the contaminated areas: irregular in size and shape, as wind and topography might form them, would have no visible boundaries. No survivor could be certain he was not among the doomed, and so added to every terror of the moment, thousands would be stricken with the fear of death and the uncertainty of the time of its arrival."[10]

1.

Overall, estimates of cancer fatalities due to the global radiation doses from the atmospheric nuclear testing program of the five nuclear-weapon states that are parties to the nuclear Nonproliferation Treaty and that are also the only permanent members of the UN Security Council, which gives them veto power over global security decisions, run into hundreds of thousands between the start of testing in 1945 and the end of the 21st century.

There are considerable uncertainties in the risk of cancer death from exposure to low levels of radiation, but all careful scientific evaluations,

including the most recent ones, have concluded that every increment of exposure to radiation produces an incremental risk of cancer. The range of estimates of cancer deaths as a result of testing fallout, using the official U.S. Environmental Protection Agency cancer risk coefficients, is between about 200,000 to more than half a million.[11] The number of cancer cases, including thyroid cancer, which has a low fatality rate (about 5 percent), would be considerably greater. No sound global estimate of cancer incidence is possible because no study comparable to the 1997 U.S. National Cancer Institute study has been carried out on a global scale. Indeed, even the thyroid cancer risk in Canada due to testing in Nevada has not been evaluated, although it is apparent from the National Cancer Institute study as well as the similar dietary patterns between Canada and the United States that people in several parts of Canada would have been significantly affected.

Further Dangers

That was not the only damage caused by nuclear weapons establishments. There are many other examples. Some from the United States include:

• From the 1940s into the 1970s, more than 23,000 people were subjected to radiation experiments, many without their informed consent. They were administered by the Atomic Energy Commission (AEC), the Department of Energy, the Department of Defense, NASA, and the Department of Veterans Affairs for purposes including determining the biology of radiation intakes, developing radiation weapons, and determining radiation's effects on military personnel performance on the battlefield. One experiment involved feeding oatmeal with radioactive trace elements to more than 100 boys at a Massachusetts school. Others included testicular irradiation experiments on prisoners to determine what doses induce sterility and experiments on pregnant women. In 1993, after learning of a particularly troubling series of experiments involving the injection of plutonium into unknowing subjects, then-Secretary of Energy Hazel O'Leary remarked, "The only thing I could think of was Nazi Germany."[12]

• A quarter of a million armed forces personnel participated in nuclear weapons tests in the United States alone. They were marched into ground zero, they scrubbed plutonium from the decks of contaminated ships, and they flew planes through the mushroom clouds to sample them and to test how pilots might function in a nuclear war environment. It took until the end of the 1980s for the U.S. government to recognize the harm and begin a compensation program.

• During the Cold War, more than half a million weapons complex workers in the United States were exposed to radioactivity and chemicals in the course of their work. In the early decades, many were exposed without proper information or training, with authorities sometimes hiding the risks so that hazard duty would not have to be paid, among other reasons.[13] The atomic weapons establishment did not actually calculate radiation doses to workers received due to inhalation and ingestion, even though data were being collected and analyzed in the form of urine samples. Congress passed a compensation program for nuclear weapons workers in October 2000.

• During the 1950s, it was well known that exposure to radon and its decay products in unventilated mines was a health hazard and increased the risk of lung cancer, but the AEC, the Department of Energy's predecessor, did not require that the mines be ventilated, choosing instead to emphasize production.[14]

Even today, people who live along the Savannah River and use its water downstream of the Savannah River Site, a nuclear weapons materials plant, are drinking water contaminated with tritium, which is radioactive hydrogen. This contamination level is at about 5 percent of the present-day drinking water standard. However, these standards are set for a grown male, called "standard man," and they do not consider the effects of radioactive water on developing fetuses. They do not consider miscarriages and other non-cancer effects. No removal is planned of the source of the tritium contamination, which lies in the unlined pits and trenches where radioactive waste was dumped in cardboard and wooden boxes. Unless the long-lived and especially risky wastes, such as liquid high-level wastes in tanks, are recovered and stabilized and isolated from the human environment, the risks will persist.

The most recent insult from the nuclear establishment comes via the Environmental Protection Agency. Its Office of Radiation and Indoor Air has proposed standards for geologic isolation of highly radioactive commercial and military wastes for the very long-term (beyond 10,000 years) for the proposed Yucca Mountain, Nevada site that would set radiation protection back decades. The proposed rule is far more lax than any other Western country. By allowing a radiation dose of 350 millirem per year, women exposed over a lifetime would have a 1 in 30 chance of getting cancer as a result [15]. If radioactivity leaks are at the higher end of estimated values (resulting in a dose of about 2,000 millirem per year), the lifetime risk for women of getting cancer due to the exposure would be about one in five.

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3.

Some argue that that we need not worry about radiation doses at times so far into the future. There are other risks that are far greater here

and now and in the coming years, decades, and centuries. Indeed., there are. The main risk exposed by the reasoning behind the proposed Yucca Mountain standard and other recent backsliding on nuclear waste management is that the government is willing to jettison rules and norm designed to protect the public, no matter how well established, to accommodate powerful political and financial interests, including in the nuclear industry. Yucca Mountain has repeatedly been demonstrated to be a site that is unlikely to meet the government's rules for radiation protection. But instead of trying to find a new site, those rules have been changed at least three times in major ways, the most recent being the EPA proposal for acceptable levels of long-term exposure.

Hundreds of thousands of people have been similarly affected in other nuclear-weapon states. The main difference between them and the United States has been that the United States has been more open and hence has, under public pressure, acknowledged a wider scope and depth of harm, although that task is still far from done. India has strict secrecy laws surrounding its nuclear weapons activities, much like France and the United Kingdom. The least is known about China, Pakistan, Israel, and North Korea.

It is a remarkable fact of nuclear weapons history and radiation risk that every nuclear-weapon state has first of all harmed its own people in the name of national security. For the most part, they have done so without informed consent.
Nor is the damage confined to nuclear- weapon possessors. Uranium for nuclear weapons was mined in many non-nuclear-weapon states. France got its uranium in large measure from its colonies, where working conditions in mines were—and continue to be—scandalous. The United Kingdom got its uranium partly from Namibia. The Soviets got much of their uranium from vast operations in Eastern Europe, notably in East Germany and the former Czechoslovakia. Health and environmental problems have typically been serious, so far as independent evidence indicates, but have usually been officially denied.[16]

The statement of then-Deputy Secretary of Energy W. Henson Moore at Rocky Flats in June of 1989 at the end of the Cold War was a kind of mea culpa about this. Nuclear weapons production, he told The Washington Post, has been "a secret operation not subject to laws... no one was to know what was going on." He added that "the way the government and its contractors operated these plants was: This is our business, it's national security, everybody else butt out." The "everybody else" he was referring to was not a foreign power, but the people of the United States. Other countries have not had a comparable confession, although their nuclear establishments have been as high-handed and their people have likely suffered similar kinds of consequences.

In a reverse of the doctors' dictum to "first do no harm," nuclear weapons establishments have first harmed the people of their own countries, as well others around the world. They have shown a readiness to harm. Given the nature of the problem and its main sources, the permanent members of the UN General Assembly and the UN Security Council should call for a global truth commission to investigate the harm that nuclear weapons production and testing have done and continue to do to people all over the world.

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ENDNOTES

1. International Physicians for the Prevention of Nuclear War (IPPNW) and Institute for Energy and Environmental Research (IEER), Plutonium: Deadly Gold of the Nuclear Age (Cambridge: IPPNW Press, 1992), chap. 4.
2. Ibid.
3. Pat Ortmeyer and Arjun Makhijani, "Worse Than We Knew," Bulletin of the Atomic Scientists, November/December 1997.
4. IPPNW and IEER, Radioactive Heaven and Earth: The Health and Environmental Risks of Nuclear Weapons Testing in, on, and Above the Earth (New York: Apex Press, 1991), chap. 4.
5. Barton C. Hacker, Elements of Controversy: The Atomic Energy Commission and Radiation Safety in Nuclear Weapons Testing 1947-1974 (Berkeley, CA: University of California Press, 1994), p. 43.
6. Philip L. Fradkin, Fallout: An American Nuclear Tragedy (Tucson, Arizona: University of Arizona Press, 1989), p. 148. For a history of nuclear testing, see.
7. IPPNW and IEER, Radioactive Heaven and Earth, p. 59.
8. Ortmeyer and Makhijani.
9. "Polynésie: Le Mensonge Nucléaire," Le Figaro, May 19, 2005.
10. IPPNW and IEER, Plutonium, p. 143 (U.S. Joint Chiefs of Staff evaluation of the 1946 tests at Bikini Atoll).
11. The total committed dose equivalent to the global population through the year 2100 is estimated at 544 million person-rem. IPPNW and IEER, Radioactive Heaven and Earth, p. 37. The doses are much larger if estimated for longer periods, mainly due to the very long-lived radionuclides, of which the most important is carbon-14, which gets into food and becomes incorporated into our bodies and all ecosystems. Carbon-14 has a half-life of 5,730 years, meaning that significant amounts will remain for tens of thousands of years in the atmosphere in the form of radioactive carbon dioxide, to be taken up by plants. Carbon-14 also occurs naturally, created mainly by the interaction of cosmic rays with nitrogen in the atmosphere.
12. Arjun Makhijani and Ellen Kennedy, "Human Radiation Experiments in the United States," Science for Democratic Action, vol. 3, no. 1 (Winter 1994).
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14. Arjun Makhijani and Lisa Ledwidge, "Back to the Bad Old Days," Science for Democratic Action, vol. 11, no. 4 (September 2003).
15. Press release of the Institute for Energy and Environmental Research, August 9, 2005, on the web.
16. Arjun Makhijani, Howard Hu, and Katherine Yih eds., Nuclear Wastelands: A Global Guide to Nuclear Weapons Production and Its Health and Environmental Effects (Cambridge, MA: MIT Press, 1995 and 2000), chap. 5.