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NUCLEAR WITNESSES, INSIDERS SPEAK OUT: ERNEST J. STERNGLASS, PHYSICIST

We are at the University of Pittsburgh Medical School in the office of the director of the Department of Radiological Physics, Dr. Ernest Sternglass. He is sitting in a swivel chair in his tiny, cramped office. He is a man in his late fifties, balding, with glasses. He came to the United States from Nazi Germany when he was fourteen, in 1938. He leans forward, gesturing with his hands. "I know how a government can be totally destructive of its own people, how people in the highest level of government can use lies to achieve their political purposes."

"The military supports secrecy, and the military is behind the entire nuclear reactor program, and behind the entire Plowshare Program. It’s behind everything connected with nuclear energy—even artificial hearts powered with plutonium pacemakers."

The following is chapter 3, from the 1982 book *Nuclear Witnesses, Insiders Speak Out*, and is an interview with Dr. Ernest J. Sternglass, at the time the director of the Department of Radiological Physics at the University of Pittsburgh Medical School, detailing his personal experiences and knowledge regarding the nuclear establishment. For decades Dr. Sternglass has been studying the effects of low-level radiation on human health and is a staunch advocate of the public’s right to know about the true costs and consequences of exposure to low-level radiation on the human body—especially the fetus, the young, and the elderly, as well as on the gene pool

This book provides a wealth of information about the radioactive contamination of Mother Earth by the nuclear industry since the 1940s. Quoting the book’s author Leslie Freeman, "It is the premise of this book that if the American people knew the truth about radiation there would be no nuclear issue." The myth is that there is a "safe threshold" of exposure to radioactive material, a permissible does below which no health effects can be detected. Who’s interests are being served here? Who benefits? Certainly *not* the people being dosed!

As much as some people attempt to deny the facts, *all* of us are being dosed on this planet by the new "fire" a select group of people have been playing with since the early 1940s and the anonymous industry "moghouls" hiding behind them using the screen of "national security" to fatten their own bank accounts while the life of all is shoved over the abyss into extinction. The gene pool of life evolving here for at least hundreds of millions of years has been seriously damaged in less than the past fifty years by the most banal of human failings. The time remaining to reverse this culture of "lemming death" is growing shorter. In the future, what will you tell your grandchildren about what you did in the prime of your life to reverse this death process?

— ratitor

[text in italics denotes the author's—Leslie Freeman's—voice.]

"Back in 1947 they knew. The data had been gathered at Argonne National Laboratory.[1] They knew that the newborn puppies, whose mothers had been fed small amounts of radioactive strontium-90, were dying of underdevelopment and serious birth defects. The government knew, and decided to keep it secret. The government set up the study. The government knew the results. And the government kept those results from the American people. Why?"

We are at the University of Pittsburgh Medical School in the office of the director of the Department of Radiological Physics, Dr. Ernest Sternglass. . . . He came to the United States from Nazi Germany when he was fourteen, in 1938. He leans forward, gesturing with his hands. "I know how a government can be totally destructive of its own people, how people in the highest level of government can use lies to achieve their political purposes."

Dr. Sternglass has been working for almost twenty years to publicize the dangers of low-level radiation. His article on the increased incidence of leukemia from fallout was published in "Science" in the spring of 1963. The Atomic Energy Commission "pooh-poohed the whole thing." They said his statistics "weren't good enough." His findings threatened the nuclear establishment. The government and the nuclear industry tried to discredit his evidence by making Dr. Sternglass out to be a "kook." It took courage to continue to speak out. . . .

The year 1947 was a turning point for Sternglass. . . . [he] had the opportunity to meet Einstein in person.

. . . we talked for five hours. All afternoon. . .

He returned in a few minutes. "Tell me," he said, "Are you planning to go back to school?"

"Yes, I'm thinking about it."

"Don't go back to school. They will try to crush every bit of originality out of you. Don't go back to graduate school."

"Well, I—"

"Be careful. There will be enormous pressures to conform."

And then he told me about his own life and the mistakes he had made. "Don't do what I've done," he said. "Always have a cobbler's job. Always have a job where you can get up in the morning, face yourself, that you're doing something useful for humanity. Because nobody can be a genius every day. Don't make that kind of mistake. You know, when I accepted a job at the University of Berlin, I had no duties really. Nothing to do except wake up and solve all the problems of the universe every morning. Nobody can do that. Don't make that mistake.". . .

While I was opposed to bomb testing and concerned about the misuse of medical X-rays, I still believed that you could keep radioactivity inside a nuclear reactor. All you had to do was make it airtight. I believed we could have thousands of nuclear reactors without danger of radiation. . . . But in 1970 my view changed.

Early in May 1970 I gave a talk at a meeting of physicists in Wisconsin. At that meeting I secured a report put out by the Bureau of Radiological Health about radioactive releases from nuclear power reactors. On the plane home, I opened this thing, and there I saw that instead of .001 or .0001 curies[24] coming out of nuclear reactors, as I had been told about Shippingport,[25] some reactors were discharging hundreds of thousands of curies—millions, hundreds of millions times more than what I had been led to believe.[26] It was all in the official tables.[27]

I was shaken up, and I said to a group of my medical students at Pittsburgh, "What do we do now? If I'm right about fallout, and these figures are right about radioactive releases, then there must be increases in infant mortality around every nuclear reactor in the United States."

So the students went to the library. I told them to take a look at the Dresden reactor near Chicago.[28] And what we found was exactly what we expected—the closer you got to the reactor, the more babies were dying. When radioactive releases went up, so did infant mortality; when they went back down, so did infant mortality. Babies were dying of respiratory failure, of all sorts of ordinary conditions normally associated with prematurity.

Some would say, "Well, the baby was premature. That's why it died."

But when we looked at the statistics we found that prematurity grew 140 percent in the county when the radioactive releases went up and declined again when the leaky fuel rods were replaced. I got a friend of mine, Dr. Morris DeGroot, head of the Statistics Department at Carnegie-Mellon University, to look at some of these things. He did his own study, using a different technique, and he found definite, positive relations between releases of radioactivity and infant mortality.[29] . . .

Until 1970 or so I had really believed that one could trust our scientists and engineers to be honest. I really believed that our bureaucrats in Washington were honest people. And some of them were. They had written a report telling about the large leaks of radioactivity coming out of nuclear reactors.[42]

Little did I know that soon those honest people would be fired, stripped of their power to do any further detailed investigations of nuclear reactors. Their authority would be transferred from the Environmental Protection Agency to the newly created Nuclear Regulatory Commission—really just a bunch of AEC boys that would be moved over.

Nixon did this. I think he got a big payoff from the utilities, the oil companies, the banks, and all the other big corporations that had a heavy investment in uranium. The facts were devastating. The big corporations that were violating environmental laws and worker safety laws made payoffs so that the Nixon administration would go easy on enforcement. And Nixon promised the big energy companies, "No more regulation. We're going to hold the regulators down."

All attempts to enforce tighter regulations were turned aside and sabotaged, so that nuclear reactors were able to release the highest amounts of radioactivity ever recorded in the history of nuclear energy in 1974 and 1975 at the Millstone plant.[43] Two million nine hundred and seventy thousand curies of radioactive gases were discharged. One curie represents as many disintegrations per second as a whole gram of radium. The entire world's supply of radium in hospitals before the bomb was a few dozen grams. And they were releasing millions of curies of radioactive gases into the air of Rhode Island and Connecticut, not giving a damn. Except how much "on time"[44] the reactor would have, how efficient it would look, and how many more reactors they would sell, based on their excellent operating record.

When I turned against nuclear reactors—as contrasted to just attacking bomb testing—the Health Department of the state of New York, the Health Department of Pennsylvania, Governor Shapp's Commission, the Atomic Energy Commission, and the Environmental Protection Agency all issued statements saying that there was no truth, no credibility in anything I had found. And I lost almost all my friends who had stuck by me when I was only attacking bomb fallout—because in effect I was saying that they were not only unwitting baby killers during the time of the bomb testing, but they were baby killers whenever they ran a nuclear reactor, whether it was at Waltz Mills, Shippingport, Millstone—or anywhere.

But I could not remain quiet about nuclear reactors. If I had, it would have been criminal on my part. Secrecy is the one way an open society can be controlled—namely by keeping things from the public.

The military supports secrecy, and the military is behind the entire nuclear reactor program, and behind the entire Plowshare Program. It's behind everything connected with nuclear energy—even artificial hearts powered with plutonium pacemakers.

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Author’s Note

Two things happened that led me to write this book. First, a doctor tried to convince me to take radioactive iodine for an overactive thyroid. I refused. Several months later John Gofman told me I was very fortunate. The radioactive iodine, he explained, would have increased the chance of my getting cancer by more than 100 percent.

The other thing that led me to write this book was the accident at Three Mile Island. Coincidentally, my thyroid condition had been diagnosed the same week that Three Mile Island vented radioactive gases into the atmosphere. I read everything I could lay my hands on, groping for the truth behind the evasive reports published by the Nuclear Regulatory Commission. I finally read verbatim transcripts of the Commissioners’ meeting held the day after the accident. The words these men said to each other stunned me. They had no idea what was happening and no idea how to stop it. And meanwhile they were issuing reassuring reports to the public.

I wanted the truth. For the first time I felt my survival was at stake—nuclear power was not an abstract issue: it was a matter of life and death. I started to talk to people—scientists, doctors, nuclear workers.

I interviewed twenty-four people who have worked with or around nuclear materials. In nineteen cases I traveled to the person’s home or place of work. Most interviews took between two and four hours and were followed up by phone interviews. I taped the in-person and telephone interviews and listened to them several times, taking notes. I then selected and transcribed those which I felt contained the clearest and most important information and were also the most fascinating as narratives. These were the transcripts from which I worked for the chapters of this book.

A word about the editing I did. In every case I tried to maintain the exact words, the exact flavor of the speech, and the exact meaning intended by the speaker. I have cut out sections that were redundant, irrelevant, unnecessary, or confusing. The repetitive "you know" or "like I said" was eliminated when it seemed too distracting— appropriate perhaps in conversation but not on the page.

Each chapter was returned to the narrator in draft form for comments, accuracy, and approval. In some cases a name was changed to protect an informant, an expression was changed, a statistic was corrected.

The final version of each chapter was then written—including an introductory section, footnotes, and a bibliography of sources relevant to the chapter. Each narrator was also asked for a photograph to include with his or her chapter.

The question that I asked initially in each interview was about personal background. This was followed by a series of questions about what experiences the person had which made him or her change or develop a point of view on nuclear power. I did not merely listen. When I did not understand, I asked questions. When I did not believe something, I said so. I asked for proof, for reasons, for the thoughts and feelings which made people act the way they did. I asked them to describe experiences in such a way that I could see what they saw and hear what people said and did. They described specific hearings and meetings. Again and again I asked to be told what went through their minds as they experienced the things they told me about. It was these personal moments that most brought me into their lives and that I have attempted to bring to the reader.

It is the premise of this book that if the American people knew the truth about radiation there would be no nuclear issue. The information speaks for itself. In this book people who have had direct personal experience with the nuclear establishment speak about what they learned. They did not necessarily start out as proponents or opponents of nuclear power; they are people who have in common a genuine respect for hard work. In almost every case they found their integrity as workers threatened by involvement with the nuclear establishment. When they mentioned that something was done sloppily, that some regulation was being violated, that something was dangerous, their concerns were ignored, trivialized, rationalized, or twisted. Some, unable to work under such conditions and feeling their sense of decency outraged and their survival in jeopardy, began to speak publicly. Then they found out what they were up against: it wasn’t just their boss, it wasn’t just their boss’s boss: it was the union, the utility company, the military-industrial complex that were insisting on the myth that nuclear power was "safe." No one was permitted to challenge this myth and retain credibility. Nuclear energy existed for the "benefit" of the people and nuclear weapons were necessary for "national security."

The stories in this book are evidence that even in the face of intimidation, people still believe their own experience matters and that other people matter. They are concerned about the lives of their children and the continuation of the species. These people know that when people hear the truth, they listen.

CHAPTER 3
Ernest J. Sternglass, Physicist

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"I was giving a paper at a health physics meeting here in Pittsburgh. I figured, at least here there would be some newspaper reporters. Someone told me, go, talk to one of the reporters in the newsroom. So I did. I gave him a rundown of the significance of my findings. He took notes and said he'd do a story. That story never got out on the wires. Some time later I told someone at the AP office in Pittsburgh about my findings. 'Dr. Sternglass, how come you didn't give us this story before?' I said, 'I did give it to you. There was a stringer.' And I gave him his name. He said, 'I'll look it up.' And he called me up and said, 'There is no such individual working for Associated Press.' Who had I spoken to? I never found out."

After World War II the U.S. military was intent upon building up its weapons arsenal. But Americans were sick of war. The military figured that the way to get their weapons program funded was to make the bomb look "peaceful and happy," to take away the spectre of war and transform atomic energy into a "promise for peace." The "peaceful atom" was a cover for the continued proliferation of weapons development. It was an elaborate lie. Dr. Sternglass gradually

1. The study referred to here was performed under the auspices of the Atomic Energy Commission in 1945 and 1946. Reports were printed by the AEC in 1947 (USAEC Report CH-3843, Argonne National Laboratory, 1947) and 1948 (USAEC Report ANL-4227, pp. 71-82, Argonne National Laboratory, 1948) but the complete results were not made public until 1969. See Miriam P. Finkel and Birute O Biskis, "Pathologic Consequences of Radiostrontium Administered to Fetal and Infant Dogs" in *Radiation Biology of the Fetal and Juvenile Mammal, Proceedings of the Ninth Annual Hanford Biology Symposium at Richland, Washington, 5-8 May 1969,* ed. Melvin R. Sikov and D. Dennis Mahlum, CONF-69050 (Springfield, Virginia: Clearing House for Federal Scientific and Technical Information, 1969), pp. 543-564.

realized how far-reaching the lie had been. "The military was behind everything."

Growing Up: Germany, X-rays, and War

Ernest Sternglass was born in 1923 in Berlin, Germany. Both his parents were physicians. His mother, a pediatrician and obstetrician, had an office in their home. His father's dermatology office was in another part of Berlin, and for some reason he had a number of fetuses in bottles high on a shelf, fetuses at every stage of development. He also had X-ray equipment and ultraviolet machines which he used in treating skin cancers and other conditions. Sternglass's parents frequently discussed their cases at the dinner table. "I remember them talking about patients who had been given excessive amounts of radiation for acne or ringworm of the scalp, patients who then came to my father for treatment."[2]

When Hitler came to power, the Sternglass family knew they would have to leave Germany eventually. Sternglass was ten years old, old enough to understand the growing danger. "We had a little house in the country, and there were days, sometimes nights when people came to throw rocks, trying to break our windows. I lived in fear of my father being arrested at any time." The Sternglass family finally left Germany in 1938, when Ernest was fourteen, and by the time they came to the United States, Sternglass was "very appreciative of what this country meant."

The family was in difficult financial straits when they arrived in New York City. While Sternglass's father learned English and struggled to pass his Licensing Board Examinations, his mother supported the family by giving health massages and working as a doctor in summer camps. Sternglass did household chores to help out.

When Sternglass completed high school at the age of sixteen, war had broken out in Europe, and while he did not know what would happen, he decided he would go to college. Although his heart was in physics, in basic research, his mother persuaded him in another direction.

"You aren't going to have a job to support yourself and your family if you are only a physicist," she warned her son. "You need something like engineering—something practical to keep you going. Later on, if you want, you can always turn to physics."

So when Sternglass entered Cornell, he registered for an engineering program. His family was still deep in financial trouble, and he had to leave school for a year to help support the family. When he returned to Cornell, the United States had already entered the war, and Sternglass learned that people were wanted in radar and electronics. Since he had had some engineering training and had studied electronics, he volunteered for the navy.

"I was about to be shipped out with the invasion fleet to Japan, when the atomic bomb was detonated over Hiroshima. When the announcement came about this bomb that had suddenly ended the whole war, I was very relieved. I didn't have to be shipped out. Only later did I understand what had happened, what the bomb meant."

After the war, Sternglass married and moved to Washington, D.C., where he worked as a civilian employee at the Naval Ordinance Laboratory, which researched military weapons such as mines, torpedoes, and guiding systems for underwater missiles. Sternglass began investigating imaging devices that would enable a soldier to see the enemy at night. He found the work

2. In the 1920s and 1930s it was common practice to treat skin disorders, such as acne and ringworm of the scalp, with X-ray treatments.

fascinating. "I wanted to understand the interaction of electrons with matter, the penetration of electrons into solids, and the scattering of radiation by solids." Sternglass's work involved radiation, an interest dating back to his childhood. He began to explore a theory of electron emission from solids, related to the photoelectric effect, for which Einstein had won the Nobel Prize.

The year 1947 was a turning point for Sternglass. Not only did his wife give birth to their first son, but Sternglass had the opportunity to meet Einstein in person.

Meeting Albert Einstein: 1947

Let me explain what Einstein had done many years ago. In 1905 he discovered that light behaves like a particle. Instead of acting like a wave that spreads out all over, light waves—or photons—hang together like little balls, little bunches of radiation. When they hit a metal plate, they knock out an electron, a single electron, right out of the plate. Light hits a metal, and if there is enough energy in the light, it will overcome the force that binds the electron in the metal. For this discovery Einstein received the Nobel Prize.

My ideas about this phenomenon were somewhat different, and I wrote to Einstein about them. Three days later I received a letter asking me to come visit him. I was all shaken up. After all, I was just a young kid who hadn't even finished graduate school. I was only taking one or two courses at George Washington University in the evenings.

I remember arriving in Princeton and walking from the station over to Einstein's house. It was a beautiful day in April, but I was shaking all over inside. I didn't know if I would be able to talk to him at all. God, he must get thousands of letters.

I walked up to this beautiful little white frame-house on Mercer Street, and knocked on the door. One of his secretaries came and ushered me in.

"Here. You sit here and wait."

I waited in the dining room, which had icons all around it. I was really amazed looking at them. Why would he have icons in his dining room? Then I saw him coming down the hall, shuffling in his slippers, wearing his baggy gray pants, and the white hair, exactly the way all the pictures looked. He was close to seventy at the time.

He looked at me and said, "Well, young man, the weather is nice outside. Let's go and sit on the back porch."

So we went through to the back of the house and sat down. He lit one of these long clay pipes he had and said, "First of all, tell me about your ideas."

And so I started talking, but he stopped me.

"Tell me, do you still speak German?" he said.

"Yes." I still had rather a heavy accent.

"Well, then," he said, "let's talk in German. It's easier. So tell me about your ideas."

He listened very carefully. I explained how I believed one cannot treat the metal as if there were only one electron per atom, but one had to look at the whole structure of the atom deeply.

And he nodded. "That sounds pretty reasonable to me."

When I got through, he said, "I think you're on the right track. Keep this up. I think that's the right direction."

Oh, I felt very pleased.

"Now let's talk about some interesting things," he said, "*really* interesting things. Tell me your ideas about particle physics."

"Well," I said, "people have been trying to come to grips with this particle concept for years—"

And he said, "Yes, I know, I know. . . ."

I told him that I felt that of all the particles that had ever been discovered, only one we've seen so far does not disintegrate, can never be smashed up, which seems to be the ultimate smallest charge. And that's the electron.

He said, "Yes. . . ."

And I said, "No one has ever seen an electron and positron annihilating without any ashes left over. They become pure energy. They form two gamma rays, two light waves."

And he said, "That's certainly true."

And I said, "It seems to me that we should look at the electron as a source of an electric field, and forget any idea that there's a little hard core of matter inside the electron."

And he said, "Mmmm . . . I thought about this at some time myself."

Then I said, "Well, I believe that's the only way we can make any progress, because there's no point worrying about what holds the electron together at this time, if we have absolutely no way of knowing that the electron ever disintegrates. Why not assume that the total mass of the electron is simply due to the pure energy in its field?"

And he said, "Well, that's possible. But we don't have any solid knowledge about this. . . . I've thought about this."

I reminded him of things that he had said at various times in his life about the electron. At times he had talked about it as being like a little hard ball of matter and having some charge around it, and at other times he had talked about it as being a pure field entity.

He said, "Well, you know, I made many mistakes in my life, and you're right, you have to keep trying. Let's talk some more. What about light waves? How do you explain the fact that the photon hangs together?"

And I said, "I really don't have any adequate model for it yet, but—"

"Well," he said, "that will take a long time to discover, but you might follow up this business of the electron being just a pure charge." He put down his pipe. "Why don't we go for a little walk here in the garden?"

As we started walking, he said, "You see that tree over there? Now turn around. Now that you don't see the tree, is it still there?"

And so we got to talking about fundamental problems of quantum theory. And after we had discussed philosophy for a long time, a secretary came out and said, "Dr. Einstein, there is someone waiting for you. You have another appointment."

He turned to me, "You be quiet and sit here. I'll get rid of him quickly!"

I sat there and said to myself, My God, it's strange that he should have an interest in continuing to talk to me, an absolute nobody.

He returned in a few minutes. "Tell me," he said, "Are you planning to go back to school?"

"Yes, I'm thinking about it."

"Don't go back to school. They will try to crush every bit of originality out of you. Don't go back to graduate school."

"Well, I—"

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And then we talked a good deal more about his attempts to formulate a unified theory.

"Look," he said, "come upstairs." So he took me upstairs to his study. "You see these papers here?" They were full of the equations of the unified field theory that he'd been working on for years. "You see all this? I will never know whether any of this has any meaning whatsoever."

And so we talked for five hours. All afternoon. Among the things we talked about was the atomic bomb. This came up because he was terribly depressed about the fact that the bomb was going to be used again, that the nations of the world had not managed to find some international way of controlling it. He and many other concerned scientists at Los Alamos were in the midst of a campaign to mobilize the scientific community and educate the public. The bomb was not just another weapon. The use of this bomb could lead to the destruction of mankind.

His sense of guilt was enormous—the sense of having made so many mistakes, of having allowed himself to be used in the business of getting the first bomb built. Even though he hadn't worked on the bomb himself, he had written a letter to Roosevelt, telling him about the discovery of fission. The Manhattan Project had followed.[3] I could see Einstein felt tremendously unhappy about this. Not only because of Hiroshima and Nagasaki, but because more bombs were being created. He was concerned that Russia would soon have the bomb. This would surely lead to an arms race that would fill the world with atomic bombs, and sooner or later someone would use them.

"That, by far, is the most terrible problem confronting all of us." The man was crushed by this thought. I could see it in his eyes. He had wanted his discoveries to benefit man. His real ambition, his real hope, had been to find the secret of the universe, to understand what makes it all tick and cohere.

I learned a great lesson from Einstein: that no one can control the direction in which his research is used, for evil or for good; and I came back from Princeton a different person. I knew it would always be part of my life to prevent the use of this weapon again—in any form—and that the biggest job was to try to warn the public, show people that this was not just another weapon, that there was immense danger in atomic bombs—far beyond what anyone comprehended.

That same year Sternglass began to notice that something strange was happening to his baby. "When he tried to sit up, he wasn't able to keep his balance. I saw him fall over, again and again, hitting his head. He was a beautiful child. There was nothing amiss physically that I could see. . . ."

But by the time the baby was six months old, it was apparent that there was some serious problem. They sought help from specialists, but no one could diagnose the difficulty. For Sternglass, it was a terrible time, a nightmare. "The baby had to be cared for every minute. One thought did occur to me. My father had worked very heavily with radiation. He had used X-rays before I was born, and he had hardly ever worn a lead apron. He could have overexposed himself through carelessness or lack of knowledge. He could have damaged a gene. That gene could be showing up now in my baby."

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3. *Manhattan Project:* a top-secret wartime project to develop the A-bomb. It was established ostensibly because of fear that the Germans were working on the bomb. In fact, the Germans weren't even close to building the A-bomb. The scientists who convinced Einstein to write Roosevelt in 1939 were Leo Szilard, Eugene Wigner, and Edward Teller. See Walter and Miriam Schneir, *Invitation to an Inquest: Reopening the Rosenberg "Atomic Spy" Case* (Baltimore: Penguin Books, 1973), pp. 14-19.

Eventually the baby was diagnosed correctly at Buffalo's Children's Hospital as having Tay Sachs disease. Tay Sachs is an inherited metabolic disturbance, genetic in origin, and prevalent among Jewish people. It leads to the complete deterioration of the brain.

Sternglass was beside himself, watching his child lose one function after another. Finally he and his wife decided they could not continue to care for the child and they had him institutionalized. The baby died at the age of two and a half.

"Sometimes it gives me a chill when I think of it now. My father didn't take even simple safety precautions. And though Tay Sachs disease is common among Jewish people, still there are so many conditions—hundreds, thousands of different genetic diseases—connected to radiation.[4] *It could have been a factor. I'll never know for sure."*

Westinghouse: 1952-1967

In 1952, a year before he completed his Ph.D. in engineering physics at Cornell University, Sternglass was offered a job with Westinghouse in Pittsburgh. The Westinghouse Research Laboratory was involved in fluoroscopy. "Fluoroscopes are these screens that you stand in front of—X-ray machines—so the doctor can look at your insides. "Fluoroscopy exposes an individual to a considerable dose of radiation, and Westinghouse was trying to develop a way to use X-rays at lower doses. Sternglass knew what overexposure to X-rays could do.

He helped develop a new kind of electronic tube that could be used in fluoroscopy, and he found the work fascinating. "There were all these facilities I could use, the biggest playground in the world. Next, I worked on a new kind of television tube for satellites to take pictures of the universe. When NASA launched a satellite and my device was in there, it was exciting." Eventually Sternglass was placed in charge of the Westinghouse Lunar Station program.

Throughout the time he worked for Westinghouse, Sternglass was surrounded by people who had worked on the nuclear submarine engine at Bettis Laboratory,[5] *and he reported to the man who directed research and development on the first nuclear submarine, the "Nautilus." All Sternglass's work at Westinghouse from 1952 to 1967 involved nuclear instrumentation.*

In 1958 I went to Paris for the International Exhibition of the Peaceful Atom for Westinghouse to try to get ideas for future company projects. Like other physicists, I was optimistic about nuclear fission and the "peaceful atom." I believed nuclear fission could be enormously beneficial.

But then, quite suddenly, emphasis changed. There was talk of atomic war—and, to go along with it, of fallout shelters. I started reading up on both subjects—war and fallout shelters.

My wife was concerned too.[6] We were even thinking of putting a fallout shelter in the new home we were building in 1962. I remember thinking, Should I or shouldn't I? It would've been easy. And then I said to myself, it's crazy. There's no way to survive an atomic war. What am I

4. The researchers on the Tri-State Leukemia Survey concluded that "it does not take a very great amount of X-ray to produce the kind of genetic damage that will eventually lead to leukemia or other diseases." *Effects of Radiation on Human Health*, vol. 1, pp. 940-941. See also Chapter 2, p. 28.

5. *Bettis Laboratory:* a nuclear research laboratory operated by Westinghouse and located in Pittsburgh, Pennsylvania.

6. This was Sternglass's second marriage. The trip to Paris in 1958 was his second honeymoon.

going to do even if I get out of my fallout shelter alive? I would have to live in a world filled with huge amounts of radioactive fallout. But I left out the windows in the basement. That was my compromise, just in case. A brick wall is better than a thin window.

And then I ran across the work of Dr. Alice Stewart.[7] She had discovered that a small amount of radiation to an unborn child—even a single diagnostic X-ray—could double the child's chances for leukemia and cancer. When I saw her figures and then compared them to what one megaton bomb could do, I realized that a nuclear war could destroy the next generation.

It was madness. There was no way that one could really protect one's family, when all the food, the water, the milk, everything would be contaminated. Even if by some miracle someone should survive, still there would be no chance babies would survive.[8]

I was very upset by all these people minimizing the dangers of atomic war. One scientist working for the military, Herman Kahn, wrote a book about how the nation could survive a nuclear war.[9] And Kissinger wrote a book about small tactical nuclear wars as an instrument of policy, telling the military and political leaders not to be afraid to use nuclear bombs.[10]

But I'd worked on radiation, and I realized that nobody had really thought about the aftermath, about what would happen to people. Nobody wanted to look at it, even though people like Linus Pauling[11] had been warning people all through the fifties that we were bound to produce more genetic damage, that there was no safe threshold of radiation.

But the military keep assuring us, "Yes, there's evidence of a safe threshold of radiation below which nothing will happen. And therefore you can have a nuclear war."

My long involvement with radiation, from the time I was a child, made me very sensitive about this issue. Other scientists were more concerned about fire damage and blast damage and medical care. I decided to look at what would happen to the babies born after a nuclear war.

For the next eight years Dr. Sternglass studied the effect of nuclear fallout on infants and children. He studied populations in areas where fallout had rained down from recent atmospheric testing. He found not only an increase in leukemia and cancer, but also a significant increase in infant mortality—infants who are born alive but die before the age of one—and fetal deaths—infants who die before birth or who are stillborn. "Each nuclear test meant a loss of thousands of babies...."

The Decision to Leave Westinghouse

Between 1958 and 1966, while Sternglass researched the effects of atomic fallout, he did not experience a conflict between this research and his work at Westinghouse, one of the major

7. *Dr. Alice Stewart:* head of the Department of Preventive Medicine of Oxford University and a world-famous epidemiologist responsible for a pioneering study on the effects of low-level radiation in England, then later for her work with Dr. Thomas Mancuso on a study of nuclear workers and health effects at Hanford, Washington.

8. Young babies and fetuses are much more susceptible to radiation than adults are.

9. Herman Kahn, *On Thermonuclear War* (Princeton, New Jersey: Princeton University Press, 1960).

10. Henry Kissinger, *Nuclear Weapons and Foreign Policy* (New York: Harper & Brothers, 1957).

11. Dr. Linus Pauling: twice a Nobel prize winner, for chemistry and for peace.

suppliers of nuclear technology in the United States. Then, after developing a new type of thyroid scanner, he was invited to participate in a symposium at the University of Pittsburgh Medical School. At the end of his talk, the head of the Department of Radiology asked him to consider leaving Westinghouse to work at the medical school.

Sterngläss did not give this proposal serious consideration until later that year when he was at Stanford University working on theoretical physics.

While I was at Stanford, an article came to me from Yale University. It was a U.S. government-funded study of the survivors of Hiroshima and Nagasaki.[12] The study concerned leukemia in children born to parents who had gotten a big dose of radiation from the brief flash of the bomb in the cities. The study compared them to the children of parents who had been outside the cities, in the suburbs, and supposedly not affected much by the bomb flash. They had found no more leukemia, or other health effects for that matter, in the children of parents who had had the higher doses. Therefore, the study tended to support the idea that radiation was not that dangerous.

But they had neglected something. They had completely ignored the heavy fallout that had come down in the suburbs of Hiroshima and Nagasaki.[13]

I began to suspect that this whole study of survivors had been designed to avoid fallout—never to take into account the possibility that their control group was also exposed to heavy radiation.[14] If radiation from the fallout in the suburbs had been as significant as radiation from the intense flash of the bomb, then the lack of difference between the two populations wouldn't prove a damn thing.[15]

I had come to Stanford to work at the high-energy physics lab. But I began to think I would have to leave Westinghouse and change my life. Here I was, sitting on top of knowledge that the public was being deceived about the true effects of radiation and fallout. And I was trying to go back to my ivory tower, back to things the physics community accepted, where I felt comfortable. I thought about giving all this up, devoting myself entirely to getting to the root of all this. Down deep I knew exposing the facts about radiation from fallout would get me into a lot of trouble.

I talked to my wife: "I think I'm going to have to work on the effects of radiation on the fetus. I'm going to accept that job at the Pittsburgh Medical School and abandon my position at Westinghouse."

She agreed. I would be in a better position to talk freely and investigate the medical effects of radiation. I had to follow up on what I had begun to believe was a very important problem.

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12. Dr. S. Finch et al., *Preliminary Findings* (New Haven Yale University Study, 1966) sponsored by the Atomic Bomb Casualty Commission. They compared 17,000 children whose parents were within 2,000 meters of the bomb to children whose parents were in the suburbs farther than 2,500 or 3,500 meters from the explosion. See Ernest J. Sternglass, *Low Level Radiation* (New York, Ballantine Books, 1972), p. 63.

13. *Fallout in the suburbs:* "Fallout was probably slight and can be neglected as a major source of contaminating radiation." J. W. Hollingsworth, "Delayed Effects in Survivors of the Atomic Bombings: A Summary of the Findings of the Atomic Bomb Casualty Commission, 1947-1959," *New England Journal of Medicine* 263 (September 1960): 481-487. See also E.T. Arakawa, "Radiation Dosimetry in Hiroshima and Nagasaki Atomic-Bomb Survivors," *New England Journal of Medicine* 263 (September 1960): 488-493.

14. The Atomic Bomb Casualty Commission study was set up in cooperation with the Atomic Energy Commission and the National Academy of Science.

15. The problem was that health effects were measured by comparing an irradiated population with another irradiated population, which obviously obscured the differences between them. A real control population would have been a nonexposed population.

See p. 37 [last 2 paragraphs of the section titled, **Retaliation: The Nuclear Industry Declares War** —ratitor] in Rosalie Bertell's discussion of the Atomic Bomb Casualty Commission. This study provided the basis for determining safety standards on radiation exposure.

The "Peaceful" Atom Bomb: Project Ketch

In 1967 my hopes were still alive for the "peaceful atom." But in December of that year, when I was lying at home in bed with bronchial pneumonia, I got a call from my friend John Lofton, an editor with the *Pittsburgh Post Gazette.* He had sent me a report which I hadn't yet read, about something called Project Ketch.

"Ernest," he said, "we're asked to take a position on this. Would you please take a look at it?"

"What is it?"

"Somebody wants to build an underground gas storage cavity in central Pennsylvania by exploding an atomic bomb."

"Are you kidding?" I couldn't believe it.

"No. It's true. They want to set off a Hiroshima-sized bomb in central Pennsylvania[16] to create a storage space for underground gas. They haven't got enough gas here in the winter, and they want to pump it up in the summer, then store it underground. Somebody here has persuaded the Columbia Gas Company to take a nuclear bomb, drill a hole somewhere in a state park in central Pennsylvania, about forty miles north of State College, and explode it. You know, they think it would be a great way to use nuclear energy for peaceful purposes."

Pennsylvania, already blessed with the first nuclear reactor,[17] was now to have the first peaceful nuclear explosion on the East Coast.

Well, I looked at the report briefly, but I was sick and not an expert on nuclear bombs, so I put it away. Then Lofton called me again. He needed the help, and since I had nothing else to do I really looked at it hard. My eyes popped out when I saw that any possible accident might release as much as four million curies of radioactive iodine into central Pennsylvania, actually not very far from where a big release happened later at Three Mile Island, maybe a hundred miles away.

"These people are crazy," I told Lofton. "This is the heart of dairy country. Millions of curies of radioactive iodine would poison the milk all the way up to New England, all the way to New York, Washington, down to Philadelphia. This is madness. How can anyone—"

He interrupted me. "Ernest, look. Write me a little editorial. I'll publish it."

So I made some calculations and wrote an editorial saying that the price for the underground storage project could be an immense disaster, and could result in a huge increase in leukemia and cancer all over the eastern United States.

It appeared two or three days later, and all hell broke loose. I got dozens of phone calls. One of them was relayed to me by my wife.

"Ernest, tonight there is supposed to be a conference at Carnegie-Mellon University promoting Project Ketch. They've flown in people from the Lawrence Livermore Laboratory in California,[18] from all over the country, to try to sell this project to the engineering community of Pittsburgh, and your editorial has exploded right under them. People want to know if you are going to be there."

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16. The proposal for Project Ketch called for detonation of a twenty-four kiloton explosive three thousand feet deep near Renovo, Pennsylvania. The feasibility study was done by Columbia Gas System of New York with the Atomic Energy Commission and the Department of the Interior and submitted to the AEC on 28 August 1967. See *Nuclear Explosives in Peacetime* (Denver, Colorado: Scientists' Institute for Public Information, 1977), p. 8.

17. Shippingport Atomic Power Station, Shippingport, Pennsylvania, was started up in 1957. It was a Westinghouse reactor.

18. *Lawrence Livermore Laboratory:* the government's Lawrence Radiation Laboratory at Livermore, California, is a weapons laboratory, then under the Atomic Energy Commission. See Chapter 4 [on John Gofman and his long-time association with the lab —ratitor].

I had no intention of going. I hadn't even known of this meeting. "Well, I suppose I'll go," I said. "I ought to go."

That meeting was not "open" at all. It was an attempt to suppress information. When I arrived, there were little cards lying on every seat. It seemed they were only going to have written questions, and no embarrassing ones.

Hank Pierce had also just come in. Hank Pierce, a science reporter I had known for years, had written about my scientific work at Westinghouse. He knew my work, and he'd seen my editorial that day.

"What's going on here tonight?" he asked me.

"Hank, I think there's dirty business afloat. I think they're not going to allow any questions about health effects—about leukemia and things like that from this project." He said he would write my question down with his name on it and pass it in for me.

It was a big hall at Carnegie-Mellon University. Maybe two, three hundred people packed in. Up there on the stage was a combination of colonels—the military—and scientists who thought they had a nice gadget. They showed slides, and they had people talk about the great economic advantages of Project Ketch, how there was no danger. They would explode thousands of these nuclear bombs, and it would be an economic boon to Pennsylvania to have all this underground storage for the East Coast. They needed it—and on and on. It was an enormous sales pitch to make the bomb look peaceful and happy.

Everyone on the panel was lying about the true danger of what was really going to be done to the people of Pennsylvania and the entire East Coast. No one was mentioning potential side effects—if there would be an accident or anything went wrong. I decided to raise a fuss. I wouldn't let this happen.

My weapon was Hank Pierce, because I knew the panel was afraid of an editorial the next day in the *Post Gazette,* one that charged this meeting with an attempt to suppress information about the potential health threat. The plan was, if they did not get to my question Hank Pierce would get up and start to walk out, and that's exactly what happened. My question was obviously not going to be chosen. So, Hank Pierce stood up slowly and started out, and at that moment they pulled out the question he had written.

When they called him, Hank seized the opportunity. Would they allow Dr. Sternglass, if he was in the audience, to explain the concern that he had expressed in the morning's editorial of the *Pittsburgh Gazette?* And I just happened to be there.

I blew the meeting sky high. I told of a series of nuclear explosions in Nevada and New Mexico[19] that had already vented large amounts of radioactivity into the air. I pointed out that

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19. *nuclear explosions in Nevada and New Mexico:* The Nevada test site was the most extensively used location for underground bomb testing. It is located in Nye County, Nevada, about sixty-five miles from Las Vegas. Most tests before 1968 were less than four kilotons. One of them, "Palanquin" (April 1965), at a depth of 380 feet, resulted in an explosion which burst out through the hole that had been drilled for the bomb. It created a volcaniclike crater and released "most of its radioactivity." See *Nuclear Explosives in Peacetime,* p. 11.

Another test in New Mexico, Project Gasbuggy, also released a large amount of radioactivity into the atmosphere. Project Gasbuggy, a twenty-six-kiloton explosion 4,240 feet underground in the San Juan Basin of northwestern New Mexico, was the first test designed to obtain natural gas. This project, on 10 December 1967, used a so-called clean bomb of the Plowshare Program, the kind of bomb planned for in Project Ketch. The gas created by this underground explosion was far too radioactive for use. Gas was burned in the open in the hope that once the upper level of radioactive gas was vented, the gas underneath it might be usable "Hundreds of millions of cubic feet of gas" were vented, but the level of radioactivity was not reduced "to acceptable levels." Radioactive krypton-85 was released into the atmosphere. Even Fred Holzer, of the Atomic Commission's Lawrence Livermore Laboratory, said, "It is pretty clear that these concentrations, especially the tritium, need to be reduced." Radioactivity was discovered downwind of the test in the air and in plants. "The amount of radioactivity due to tritium inside those plants has been raised ten times." Once absorbed in the food chain in this way, radioactivity finds its way into milk and beef, and eventually into the tissues of human beings. See *Nuclear Explosives in Peacetime,* pp. 4-5.

these would be equivalent to many, many diagnostic medical X-rays to pregnant women all over Pennsylvania. I spelled out how many infants might conceivably be affected, and that we were talking about tens of thousands, hundreds of thousands of people being affected by a single accident.

It caused an uproar. There were questions from the audience, and more debate, and the other newspaper reporters wrote this down. And it just blew the idea that there was no danger in Project Ketch. This elaborately staged selling campaign was ruined.

Enormous things followed. It was the first citizens rebellion of the nuclear age in this part of the world. They had one hearing after another. People came and found out more about Project Ketch. And I testified. The movement grew—conservationists, local citizens, local concerned scientists at Penn State, many people came to realize that this thing was another attempt on the part of Livermore Weapons Lab to make these people guinea pigs. And they demanded cancellation of the project.

Most disturbingly the governor had already signed the papers to okay the blast! Preliminary holes had been drilled, and they were beginning to remove the trees. All approvals had been obtained from the various state health authorities. The whole thing was ready to go! They were really going to do it.

I think a lot of people who had worked on the nuclear weapons system—especially Edward Teller—felt desperate about these weapons. Nobody wants to build a gadget that is never used. They were always looking for ways to put the atom to "peaceful" uses.

So they created a large and varied program called Plowshare, basically designed to use nuclear bombs like dynamite. If dynamite can be used to kill people, it can also be used to make tunnels, to move rocks. Nuclear explosives could build a new sea-level Panama Canal[20] right smack across the isthmus of Panama. And believe me they had it all worked out through preliminary bomb experiments in Nevada. They were going to take maybe a hundred megaton worth of nuclear bombs, maybe two hundred megaton, and set them off in a string to dig this new canal.

This kind of mad scheme was active in 1966 and 1967.

The military was encouraging them, trying to make the bomb look "peaceful" with the motto, "Beating swords into plowshares." As long as you can convey the idea that setting off bombs in people's backyards is no threat, you can use these bombs to fight nuclear wars. If it's okay to dig a canal this way, and the radioactivity from that fallout isn't going to hurt anybody, then setting off nuclear weapons in Europe to defend ourselves isn't going to hurt anybody either. That's what I found out, beginning at that meeting on Project Ketch.

A Note about the Plowshare Program

Devised in the 1950s and 1960s the Plowshare Program was the brainchild of the Atomic Energy Commission. It was an elaborate attempt to convince the public that underground bomb-testing could benefit energy-hungry Americans.[21] *The AEC claimed that huge quantities of natural*

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20. Several sea-level canal routes were under consideration. Some would cut across more than sixty miles of Panama. This part of the Plowshare Program was developed by the Atomic Energy Commission in conjunction with the Army Corps of Engineers. One plan to cut through the continental divide would require three 25-megaton and one 50-megaton bomb set off together—an explosion of 125 megatons. Areas which would receive significant fallout could extend throughout South America and other areas as well.

21. Most of the information in this section is contained in James Robertson and John Lewallen, eds., *The Grass Roots Primer* (San Francisco: Sierra Book Club, 1975), pp. 125-135.

gas would be created by detonating nuclear bombs under New Mexico, Utah, Colorado, and Wyoming—areas known to possess a lot of natural gas underground in shale. Other sites, such as Pennsylvania, were selected as underground gas storage cavities. These cavities were going to hold vast amounts of gas for use in the eastern states.

The AEC projected that "nuclear stimulation"—exploding bombs underground in these areas—would create as much as three trillion cubic feet of gas. To achieve this end by the year 2060, fifty-six hundred wells, each created by four to six nuclear bombs—would be needed. A total of thirty thousand nuclear bombs were earmarked for this program.

In 1967 the AEC exploded a twenty-nine-kiloton nuclear bomb underground in New Mexico. Project Gasbuggy produced a good deal of natural gas, all radioactive and unusable. Nevertheless, another explosion was planned for 1969, a mile underground in Colorado's Rocky Mountains. This was Project Rulison. This plan elicited some protest from local residents, mostly women. Around thirty people staged a demonstration near the blast site. The test proceeded on schedule, throwing some of the demonstrators up into the air. Project Rulison produced a shock wave that damaged the foundations of buildings, irrigation lines, mines and an industrial plant. While Rulison did produce some recoverable gas, city councils in Aspen and Glenwood Springs voted that none of this gas would be used unless the citizens voted approval through balloting. In 1973 the AEC planned another underground explosion in western Colorado, Project Rio Blanco. Eight thousand signatures were obtained in the campaign to stop this explosion. The blast went off on schedule. No gas was recovered from Rio Blanco, but it cost $11 million of public money. Before 1970 a total of $138 million was spent by the federal government on the Plowshare Program. The chairman of the AEC, Glenn Seaborg, defended the Program. "Large nuclear explosives give us, for the first time, the capability to remedy nature's oversights."[22]

Nuclear Reactors Must Be Safe At Least

While I was opposed to bomb testing and concerned about the misuse of medical X-rays, I still believed that you could keep radioactivity inside a nuclear reactor. All you had to do was make it airtight. I believed we could have thousands of nuclear reactors without danger of radiation. Certainly we could keep the stuff inside a reactor, as we had done in submarines.[23] If the radiation was getting out, the men would be dead—they were living twenty, thirty feet from an enormously powerful source of radiation inside that submarine. Engineering know-how was the answer. Radiation could be contained in a reactor. I just believed it. I wanted to believe it.

I myself had worked on a project at Westinghouse, a gas-cooled nuclear reactor which would generate electricity by heating up a stream of gas. I had been excited about it, never thinking that

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22. Glenn T. Seaborg and William R. Corliss, *Man and Atom: Building a New World through Nuclear Technology* (New York Dutton & Company, 1971), p. 188.

23. Dr. Thomas Najarian conducted a study of submarine workers at the Portsmouth Naval Shipyard, where the *Nautilus* and *Tullabee* the first U.S. nuclear-powered submarines, were overhauled in the late 1950s and early 1960s. Najarian examined 100,000 death certificates, including 1,752 from Portsmouth shipyard workers. He discovered that the cancer rate among the shipyard workers who had worked with nuclear-related projects was much higher than those who had not worked on projects with the risk of radiation. The national mortality rate from cancer was 18 percent, and of shipyard workers who had worked on nuclear projects, 38 percent. See Thomas Najarian and Theodore Colton, "Mortality from Leukemia and Cancer in Shipyard Nuclear Workers," *Lancet* (1978): 1018-1020. See also "The Danger of Radiation at Portsmouth Shipyard," *Boston Globe,* 19 February 1978, p. 1.

reactors were a problem. But in 1970 my view changed.

Early in May 1970 I gave a talk at a meeting of physicists in Wisconsin. At that meeting I secured a report put out by the Bureau of Radiological Health about radioactive releases from nuclear power reactors. On the plane home, I opened this thing, and there I saw that instead of .001 or .0001 curies[24] coming out of nuclear reactors, as I had been told about Shippingport,[25] some reactors were discharging hundreds of thousands of curies—millions, hundreds of millions times more than what I had been led to believe.[26] It was all in the official tables.[27]

I was shaken up, and I said to a group of my medical students at Pittsburgh, "What do we do now? If I'm right about fallout, and these figures are right about radioactive releases, then there must be increases in infant mortality around every nuclear reactor in the United States."

So the students went to the library. I told them to take a look at the Dresden reactor near Chicago.[28] And what we found was exactly what we expected—the closer you got to the reactor, the more babies were dying. When radioactive releases went up, so did infant mortality; when they went back down, so did infant mortality. Babies were dying of respiratory failure, of all sorts of ordinary conditions normally associated with prematurity.

Some would say, "Well, the baby was premature. That's why it died."

But when we looked at the statistics we found that prematurity grew 140 percent in the county when the radioactive releases went up and declined again when the leaky fuel rods were replaced. I got a friend of mine, Dr. Morris DeGroot, head of the Statistics Department at Carnegie-Mellon University, to look at some of these things. He did his own study, using a different technique, and he found definite, positive relations between releases of radioactivity and infant mortality.[29] But for Shippingport he couldn't find a positive correlation. Only later did I learn why.

It was during the hearings on Beaver Valley—a new reactor Westinghouse planned near Shippingport—that I got a call from someone who worked at Shippingport.

"Dr. Sternglass," he said, "you're onto something, but you don't know the whole story. Would you like me to tell you the whole story?"

And he did. He told me that some years ago a friend of his at Shippingport had noticed fewer and fewer entries for air releases—radioactive releases—which have to be logged into a book. His friend became suspicious, so he walked out in the yard, and he noticed that some of the gas tanks, where they stored the radioactive gases until they could be released,[30] had broken seals on them—

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24. *curies:* a single curie of iodine-131 "could make 10 billion quarts of milk unfit for continuous consumption according to the existing guidelines" of the government. Sternglass, *Low Level Radiation,* p. 160.

25. *Shippingport:* the first commercial nuclear power plant in the United States. It is located about thirty miles from Pittsburgh, Pennsylvania. It went on line in 1957. "Zero releases" were claimed for Shippingport in 1971. See Joel Griffiths, "Backgrounding the Controversy," *Beaver County (Pa.) Times,* 7 June 1971, p. A-7.

26. Dr. Sternglass had read the report of the U.S. Public Health Service, March 1970. According to Charles Weaver, director of the Division of Environmental Radiation of the Bureau of Radiological Health, the Shippingport reactor had emitted a total of 0.001 curies into the air in 1968, or "240 million times less than was released the same year by the Dresden reactor near Chicago." Sternglass, *Low Level Radiation,* p. 161.

27. In the published record of the *Environmental Effects of Producing Electric Power,* hearings before the Joint Committee on Atomic Energy, 91st Congress, part 1, October-November 1969, Sternglass read of two nuclear reactors which in 1967 had discharged "as much as 700,000 curies." This was the first time Sternglass had evidence that nuclear reactors released enormous quantities of radioactivity routinely. See Sternglass, *Low Level Radiation,* pp. 160-161.

28. *Dresden:* Dresden Nuclear Power Station, Unit 1, Morris, Illinois, went on line in 1959. It was the first commercial boiling water reactor in the United States.

29. Morris H. DeGroot, "Statistical Studies of the Effect of Low-Level Radiation from Nuclear Reactors on Human Health," in *proceedings of Sixth Berkeley Symposium on Mathematical Statistics and Probability,* J. Neyman, ed. (Berkeley: University of California Press, 1971).

30. Radioactive gases can be released after a certain amount of time, after they become less radioactive and meet federal regulations.

locks that had been broken, and valves that had corroded and not been fixed.

So he asked his supervisor about it, and the supervisor said, "Don't worry about it. It's not your business."

Well, his friend went back again, and when he was alone on the shift he took a dish of soap, and with a brush he painted soap around the valves. When you paint a film of soap around a leaky valve and air is coming out, it makes soap bubbles. And this man found big bubbles of radioactive gases coming out. He could see them leaking out! No wonder there weren't any entries in the logbook for radioactive venting. It was happening all the time! This sort of dumping allowed Shippingport to go before the AEC and claim zero-release, as indeed they did in 1971.

Westinghouse used it in a big advertising campaign. "WESTINGHOUSE CAN BUILD ZERO-RELEASE REACTORS." I have the news clippings. Westinghouse invited people from all over the world to come and see and buy the miracle at Shippingport. "ZERO RELEASE. NO MORE RADIOACTIVITY IN THE ENVIRONMENT."

When we put the operators from Shippingport on the witness stand, one of them testified that large quantities of radioactive gases were deliberately allowed to leak out, so they would not have to report anything in the log.

That's all in the sworn testimony of the Beaver Valley-1 operating licensing hearings.[31]

So much for the reason behind Dr. DeGroot's failure to find any correlation between the officially announced radioactive releases and the changes in infant mortality in Beaver Valley.

A Note About Shippingport

In 1971 the Duquesne Light Company responsible for the Shippingport plant, hired Nuclear Utilities Services Corporation (NUS) of Rockville, Maryland, to conduct a survey of radioactivity in the general area where they were constructing a new nuclear plant, Beaver Valley-1. New government regulations required measuring the precise level of radioactivity in the general area before a new nuclear plant went on line. Although Shippingport had its own radiation monitoring program, it was not considered sufficient since "Shippingport's personnel had done relatively little monitoring beyond the plant's own grounds."[32] However, this inhouse monitoring program had made Shippingport a showcase: the plant's releases of radioactivity were known to be "the lowest of any commercial nuclear reactor in the country."[33] In 1971 the Shippingport monitoring program made Shippingport appear to be "the first commercial plant in the world to release no radioactivity whatsoever out its stack for an entire year."[34]

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31. Dr. Karl Morgan of Georgia Institute of Technology and former director of Health Physics at the AEC's Oak Ridge stated that based on "the recent testimony of one of Shippingport's own reactor operators there certainly were undetected and unreported releases from Shippingport." And Dr. Morris DeGroot, professor of mathematical statistics and chairman of the Statistics Department at Carnegie-Mellon University, Pittsburgh, said that the radiation monitoring program at Shippingport was "inadequate" and that "radioactivity levels measured in 1971 by NUS were ignored by the Duquesne Light Company, the AEC and the relevant health agencies until Dr. Sternglass blew the whistle. There was dereliction of duty, I think." Dr. Morgan agreed: "Then, when they did get some detailed environmental data from NUS showing high levels, they sat on it." Joel Griffiths, "State Panel Questions Radiation Safety," *Beaver County (Pa.) Times,* 7 June 1974, p. A-7.

32. Griffiths, "Backgrounding the Controversy," p. A-7.

33. Ibid.

34. Ibid.

NUS scientists measured levels of radioactivity in milk, drinking water, soil, and air from January 1971 to March 1972 and sent their reports to the Duquesne Light Company. In December 1972 Dr. Sternglass examined the NUS reports and found that "during the spring and summer of 1971 there had been high radioactivity levels all over Beaver Valley in many instances 20 or more times higher than normal."[35] *Radioactivity had been detected "just about everywhere they looked."*[36] *During the spring and summer of 1971 NUS had measured high levels of strontium-90 in soil around Shippingport and in milk from "six local dairies."*[37] *Iodine-131 levels in this milk were 21 percent over maximum permissible limits. This data was collected in 1971, the same year that Shippingport had claimed "zero releases" out its stack.*

When Dr. Sternglass made the NUS report public, the AEC responded by attributing the high levels of radioactivity not to Shippingport but to fallout from Chinese bomb-testing. However, after an investigation, the AEC conceded that it was "highly unlikely" that the radioactivity was from Chinese tests. "Most likely it was either of local origin or the result of inadequate sampling procedures."[38]

In February 1973 NUS was asked by the AEC to make a search for its original soil samples to prove that the radioactivity had really been there. But NUS could not locate any. This was not unusual since it was company policy to dispose of soil samples within a year. Nevertheless, in June 1973, after the AEC suggested that NUS was incompetent and an investigation would "certainly turn up gross calculation errors or even that some doctoring of the numbers had occurred,"[39] *NUS suddenly found its original soil samples and retested them. No radioactivity could be detected. Everybody was relieved—the AEC, NUS, Duquesne, and the residents of Beaver Valley.*

But nine miles east and downwind of the Shippingport plant in Aliquippa, Pennsylvania, Dr. Sternglass found that infant mortality had risen to a twenty-year high for the years 1970 and 1971, "more than double the overall state rates" and that Aliquippa had the state's third highest leukemia rate.[40]

The Larger Picture

After that, I started to look into the figures for infant mortality in the area around Pittsburgh. I knew there had been a release of radioactivity right in Pittsburgh from the Waltz Mills reactor in 1960.[41] It had happened when I was working for Westinghouse. A big cloud of radioactive gases

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35. Ibid.

36. Ibid.

37. Richard Pollock, "Business as Usual in Pennsylvania: 1971 Radiation Scare Fails to Bring Action," *Critical Mass Journal,* December 1979, p. 7.

38. Griffiths, "Backgrounding the Controversy," p. A-7. "'Local origin' was a euphemism for Shippingport, since there was nothing else in the vicinity that could have produced that amount of radioactivity"—Griffiths.

39. Ibid.

40. Pollock, "Business as Usual in Pennsylvania," p. 7.

41. *Waltz Mills:* On 3 April 1960 a fuel element meltdown occurred in the materials testing reactor operated by Westinghouse at Waltz Mills, near Yukon, Pennsylvania, some twenty miles upstream from the city of McKeesport along the Youghiogheny River, from which McKeesport gets its drinking water. This is close to Pittsburgh as well. A sharp increase in infant mortality was detected in areas of western Pennsylvania within a year following the accidental releases. See Sternglass, "Infant Mortality Changes Associated with Nuclear Waste Discharges from Research Reactors into the Upper Ohio Watershed," AEC Rulemaking Hearings on proposed amendments to 10CFR50, Washington, D.C., 15 February 1972.

had escaped from the Westinghouse testing reactor—one of Waltz Mills's big fuel elements had partially melted down. Just like Three Mile Island. Many of my friends had been involved in the cleanup. They had had to find ways to cart the radioactive stuff away. Not knowing what to do with all that radioactive liquid, they had discharged it gradually, over a period of time. And a lot of it had been stored.

I had heard about it. But, like everyone else, I didn't pay much attention. Okay, there was an accident. So there was some escape of radioactivity. But I had no inkling that Waltz Mills could have produced any change in infant mortality.

Then I looked at the health statistics downstream of the reactor on the Youghiogheny River, and I found an increase in infant mortality in the people drinking the water from the Youghiogheny. Nobody had been told how much radioactivity had washed through there. All the people were drinking the water. I felt desperate—because it was happening right here in my own home town. I read studies that showed significant quantities of strontium-90 in the neighborhood, that the fish were highly radioactive, that the soil was contaminated, that the area around the Shippingport reactor had been poisoned by years of releases from the old Shippingport plant. Since the Shippingport reactor went on line in 1957, my friends at Westinghouse had not been telling me the truth about what was going on—about how much radioactivity was really being released into the environment. Most likely they did not know about this themselves. Right here we had been poisoning our own water supply. I had been drinking that water. . . .

Until 1970 or so I had really believed that one could trust our scientists and engineers to be honest. I really believed that our bureaucrats in Washington were honest people. And some of them were. They had written a report telling about the large leaks of radioactivity coming out of nuclear reactors.[42]

Little did I know that soon those honest people would be fired, stripped of their power to do any further detailed investigations of nuclear reactors. Their authority would be transferred from the Environmental Protection Agency to the newly created Nuclear Regulatory Commission—really just a bunch of AEC boys that would be moved over.

Nixon did this. I think he got a big payoff from the utilities, the oil companies, the banks, and all the other big corporations that had a heavy investment in uranium. The facts were devastating. The big corporations that were violating environmental laws and worker safety laws made payoffs so that the Nixon administration would go easy on enforcement. And Nixon promised the big energy companies, "No more regulation. We're going to hold the regulators down."

All attempts to enforce tighter regulations were turned aside and sabotaged, so that nuclear reactors were able to release the highest amounts of radioactivity ever recorded in the history of nuclear energy in 1974 and 1975 at the Millstone plant.[43] Two million nine hundred and seventy thousand curies of radioactive gases were discharged. One curie represents as many disintegrations per second as a whole gram of radium. The entire world's supply of radium in hospitals before the bomb was a few dozen grams. And they were releasing millions of curies of radioactive gases into the air of Rhode Island and Connecticut, not giving a damn. Except how much "on time"[44] the reactor would have, how efficient it would look, and how many more reactors they would sell,

42. U.S. Department of Health, Education, and Welfare, Bureau of Radiological Health, "Radioactive Waste Discharges to the Environment from Nuclear Power Facilities," BRH-DLR 70-2, Rockville, Maryland, March 1970.

43. *Millstone Nuclear Power Station:* Waterford, Connecticut. See Sternglass, "Strontium-90 Levels in the Milk and Diet near Connecticut Nuclear Power Plants," Report to Congressman C.J. Dodd and Representative John Anderson, 27 October 1977.

44. *on time:* refers to how much time a reactor can operate without having to be shut down for maintenance and/or refueling.

based on their excellent operating record.

When I turned against nuclear reactors—as contrasted to just attacking bomb testing—the Health Department of the state of New York, the Health Department of Pennsylvania, Governor Shapp's Commission, the Atomic Energy Commission, and the Environmental Protection Agency all issued statements saying that there was no truth, no credibility in anything I had found. And I lost almost all my friends who had stuck by me when I was only attacking bomb fallout—because in effect I was saying that they were not only unwitting baby killers during the time of the bomb testing, but they were baby killers whenever they ran a nuclear reactor, whether it was at Waltz Mills, Shippingport, Millstone—or anywhere.

But I could not remain quiet about nuclear reactors. If I had, it would have been criminal on my part. Secrecy is the one way an open society can be controlled—namely by keeping things from the public.

The military supports secrecy, and the military is behind the entire nuclear reactor program, and behind the entire Plowshare Program. It's behind everything connected with nuclear energy—even artificial hearts powered with plutonium pacemakers. The military feels that they need to use nuclear weapons in order to protect this nation. You have to be willing to use the weapons. If you yourself are suspected of believing that the weapons are too poisonous to use, then they lose their value as a military deterrent. But, if we're going to get our people to fund these weapons and our soldiers to use them, they can't be told that the fallout will go back and kill their babies. Say you're a soldier, and someone hands you a gun and says, "I want you to go out now. And I've got a little gadget here that is guaranteed to really keep the Russians away. It's got two barrels on it. Now you worry about this one barrel. Let's point it at the Russians. I want you to pull that trigger when I tell you to."

And you say, "What's the other barrel for?"

He says, "Well, the other barrel is aimed at your baby at home."

Would you pull that trigger?

So they tell you there's only one barrel to the gun. Otherwise they couldn't get decent, patriotic people, willing to defend their families from being taken over by the Commies, to use those weapons and pull the triggers whenever they want them to.

That is the entire rationale behind the avid support of nuclear energy versus coal, versus solar, versus every other aspect of energy generation. Because only nuclear energy makes bombs. The military-industrial complex could not sell nuclear energy if the public knew that the use of nuclear weapons would destroy the very thing we are trying to protect, the very thing that in the past we have asked soldiers to go out into the field and give their lives for—namely the survival of their way of life, of their children, and their children's children, for which people are willing to give their lives. But to ask people to go and use a weapon whose poisonous gases would cripple the minds of their children and destroy their bodies for generations to come—could you sell that as a weapon? To Congress? Or to the soldiers who were going to be asked to die in the battlefield under the nuclear mushrooms of Europe?

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yer friendly neighborhood ratman

KOYAANISQATSI

ko.yan.nis.qatsi (from the Hopi Language) n. 1. crazy life. 2. life in turmoil. 3. life out of balance. 4. life disintegrating. 5. a state of life that calls for another way of living.