

At the Crossroads

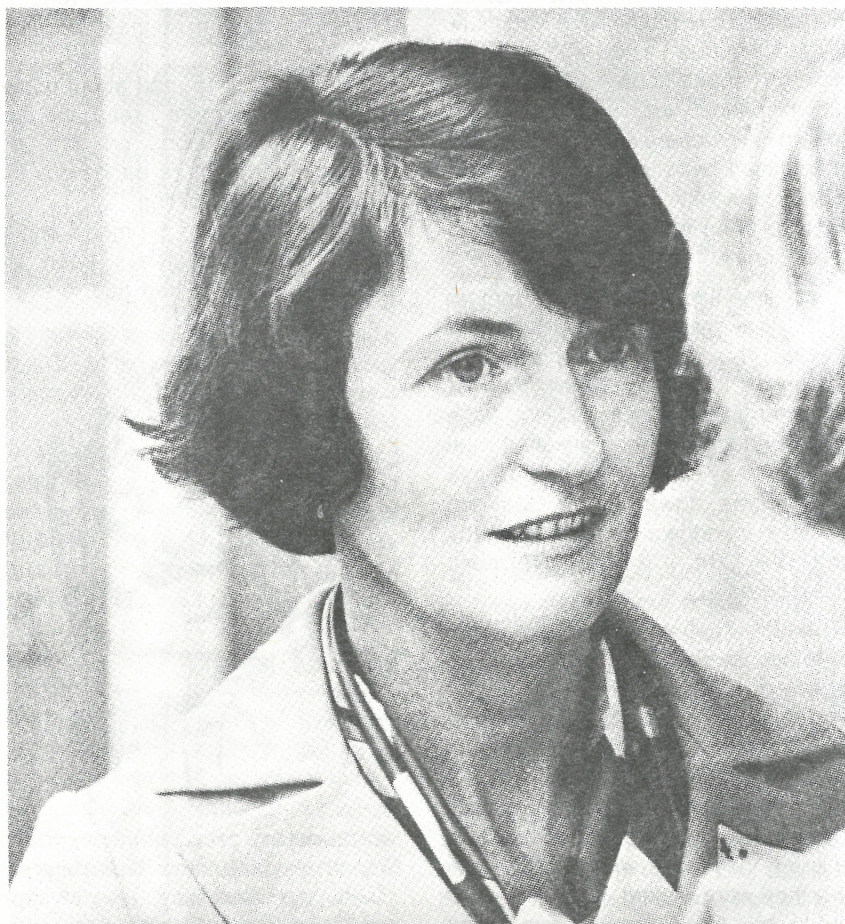
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"...If we don't get rid of nuclear power and nuclear weapons, we won't survive. Neither will the animals and plants..."

Dr. Helen Caldicott is one of the world's most articulate, active, and positive opponents of nuclear power and weaponry. The thirty-six-year-old Australian pediatrician and mother of three can claim credit for single-handedly initiating the public outcry that pressured the French government into ending the testing of nuclear bombs in the South Pacific. When not working with victims of cystic fibrosis at Boston's Children's Hospital, she lectures widely in the antinuke cause. The following article is excerpted from a speech she recently gave at a fund-raising event for Mobilization for Survival, a coalition group dedicated to ending nuclear proliferation.

I was only about six when they dropped the bomb on Hiroshima. I remember I was in school that day, and a siren sounded. The teacher said, "What's that?" I was the only kid in the class who knew. I said, "The war's ended." I knew that the bomb had ended the war, but I didn't know when I was six what that bomb meant. We all had a holiday.

I approach nuclear weapons from a medical point of view. When I did first-year medicine in 1956, we had a very good genetics lecturer, who taught us what radiation does to genes and how it can both damage future generations and produce cancer. As I studied for exams at the end of the year, I used to go out every day and get the newspaper. And every day on the front page there would be a big mushroom cloud, with a sort of "Hurray, the Americans have tested another bomb on the Bikini Atoll" or "The Russians have tested another bomb"—you know, it was that era when each country was testing bombs all the time. And I remember being frightened, because I realized what the fallout meant to children and babies and people. I used to speak of it at the university, and nobody took any notice. They thought I was a fanatical nut.



Bonnie Freer

Helen Caldicott

So I stopped talking about it. I just watched, with horror, the gradual escalation and buildup of nuclear weapon forces in the United States, and in England, and in Russia. And, like everybody else, I felt too impotent, as one individual, to do anything about it. Yet I felt, "It's my world as much as that of any politician in the world." And when I decided to have children, I felt I was probably wicked to bring children into this world; yet, for selfish reasons, I did. I felt that they probably couldn't have a normal lifespan, or that if they did, their children would not.

Then in 1972 I came back from this country, having been here for three

years and learned a little bit how to be political. I used to write to Nixon and Ted Kennedy and people like that. I found out that it's OK to do that in a democracy, and sometimes it brings results: at least they wrote back to me!

The French were testing bombs in the Pacific, and we got a high fallout in Adelaide, where I lived. They tend to collect rainwater in tanks in Adelaide because there isn't very much water in Australia—it's a very dry country. It was after a drought, and the tanks were empty, so the tanks filled up with relatively radioactive water.

I happened to be invited by a television producer to speak about acu-

puncture or something, so I did. And afterwards we got into an argument. He said, "Look, I think the Americans are doing a fine job in Vietnam." I was upset about that, and I also said, "What are the French doing in the Pacific? What they're doing is very bad." He said, "Why don't you come and talk about that? We've been trying for months to get a doctor to comment about fallout." I said, "Sure." So I went and I talked about radioactive iodine, and strontium 90, and cancer and leukemia in children. "You all know," I said, "how, when the fallout was occurring in the Northern Hemisphere and your milk was contaminated with radioactive iodine and strontium 90 in the early sixties, that helped to bring about the international test ban treaty."

Every time the French tested another bomb, I was invited back to talk on the television about fallout. People gradually learned that it wasn't really safe for their children and their babies. As a result of education, they started to get cross, and they said, "Why should those French come down to the Southern Hemisphere and test their bombs? Why don't they do it in the Northern Hemisphere?"

Then I went on an Australian delegation to see the French government, and we talked to them. They said, "Our bombs are perfectly safe." So we said, "If they're safe, why don't you test them in the Mediterranean?" And they said, "Oh, *mon dieu*, there are too many people living near the Mediterranean!" So we knew they were wicked, and they knew they were wicked, and for the first time in my life I knew I was sitting opposite wicked politicians who knew they would probably be killing people, and they didn't give a damn. Anyway, as a result of this, the French did stop testing in the atmosphere. We took France to the world court, and now it tests underground.

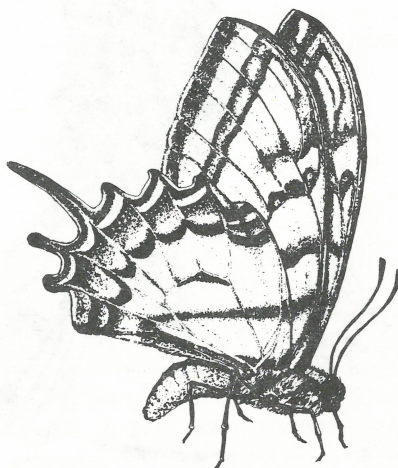
I went to the House of Commons in London, and I talked to people in the members' bar. They were all old men; they were all about seventy or above. I got a sense of the type of people who control government. And I thought, "These are the sort of guys who are running our world . . . our world, and our kids' world."

Then in '75, during the oil shortage, our prime minister, Gough Whitlam, went to Europe and said, "Hey,

everybody, we've got lots of uranium. We've got 30 percent of the free world's richest uranium. Who'd like to buy it? We'll sell it to the highest bidder." I didn't know much about uranium. I knew almost nothing about nuclear power. But I knew uranium had two uses: (1) to make atomic bombs and (2) to run nuclear power plants. I thought, "What gross hypocrisy—after making such an international fuss about the French, to start selling uranium on the open market in the world."

Then I started to read about nuclear power. And the more I read, the more my hair literally stood on end. It is millions of times more dangerous than fallout from bomb testing.

So again I went to the media and the press. They had always been very interested in what I had had to say. In



fact, I couldn't get rid of them about the French tests. But this time they said, "That's not interesting, it's not important." And I said, "What do you mean, it's not important? It's terribly important!" They said, "We're not interested." And I was very perplexed until I found out that the media had large shares in uranium mines.

So this time I wrote to the unions in Australia and asked if I could talk to them about the dangers of mining uranium—the dangers to the world and their children. They said, "You can talk to us, sure, but you'll never convince us, 'cause we need the jobs." So I went and talked to them, and in ten minutes they were saying, "I don't want my kids growing up in a world like that!" and they sent a telegram to the prime minister.

And gradually—just by going out at lunchtimes, talking to people in factories while they were eating their lunch, and

teaching them about basic genetics and radiation and nuclear weapons, et cetera—I taught the unions of Australia that it was dangerous to mine uranium.

I want to teach you a little bit of basic medicine and genetics so that you'll understand why it's dangerous. Let's start talking about nuclear power plants, because this is a step toward understanding what nuclear weapons mean and why we absolutely have to get rid of every single nuclear weapon on earth, if we're to survive. Each step of the nuclear fuel cycle is dangerous. When you mine uranium, it gives off a gas called radon. When miners breathe it into their lungs, they can get lung cancer, because it irradiates the cells in the lungs. In years past, 20 to 50 percent of uranium miners died of lung cancer.

Then, when the uranium is milled and enriched, a lot of the ore is discarded and lies around in big heaps on the ground called tailings. They give off radon gas too, for tens of thousands of years. Now, they don't give off radon if they are buried under the ground, but it's too costly to do that. In Grand Junction, Colorado, people didn't know these tailings were dangerous, so they used them to build schools and hospitals and houses and roads. There's an increased incidence of congenital deformities among the babies born in those houses. And they still live there, because it's economically not feasible to pull them down and build new ones.

OK. After the uranium is enriched, it's taken and placed in fuel rods and put in a nuclear reactor. You probably all know what a nuclear reactor looks like. It has a big round dome. Inside the reactor is the reactor core, and inside the core, they pack hundreds and hundreds of long thin fuel rods, all packed with uranium, and it's all covered up with water. At a certain point, the uranium reaches critical mass. Now, it doesn't explode, but it becomes extremely hot, and what it does is, it boils the water. This is a very sophisticated way to boil water! The water produces steam. The steam turns the turbine, which produces electricity. That's all there is to it. It's simple. But it's like cutting butter with an electrical saw.

What happens to the uranium when it starts fission? That's the important point. Well, it turns into hundreds of very poisonous radioactive elements. I will just take four as an example.

First of all, though, I should make two basic points: all radiation is dangerous; no radiation is safe. The nuclear power industries say, "Radiation is OK. We live with it." Now, if you live in Australia, and you sunbathe and you surf . . . we have one of the highest incidences of skin cancer in the world, because we're exposed to the sun. It's true: we get radiation from the sun all the time, and there's no doubt that the sun produces skin cancer. If you get little amounts of radiation over your lifetime, it's approximately the same as getting one large dose at once. In other words, it's cumulative; the effect is additive. And of all animals on earth, human beings are the most sensitive to the effects of radiation: we get cancer most easily. I don't know why, but we do. And of all human



beings, it's fetuses, infants, and young children who are the most sensitive to these effects, because their cells are rapidly dividing and growing. You can see a baby grow, almost literally. It's producing millions and millions of new cells, and the DNA molecules or genes are being synthesized or made, and that's when they're so sensitive to the effects of radiation.

Now, there are various forms of radiation. There are x-rays, gamma rays, alpha rays, and beta rays. They're all the same. They all do the same thing to the cells. They can all give you cancer. Some of them are more effective than others at giving cancer. If you have x-rays, each x-ray increases slightly the risk that you might get leukemia or cancer. That's been proven. So if you ever have to have an x-ray, say to your dentist or doctor, "Is this absolutely necessary?" And find out exactly why you're getting it. If you find that it's not entirely necessary, don't have it.

OK, now let's take four examples of the elements that come out of the nuclear reactor; iodine 131, strontium 90, cesium 137, and plutonium.

Now, the first three elements are what are called beta emitters, and plutonium is an alpha emitter. That means that if you have an atom with the nucleus in the middle and the electrons whizzing around it in orbit on the outside, the beta emitter gives off an electron. Now, if that little particle of radioactive iodine is sitting in your thyroid gland, this particle will irradiate just a few cells surrounding it. It will probably injure some of those cells; it may produce cancer.

The alpha emitter plutonium, on the other hand, emits a helium nucleus, which is a very large particle—and it is of dense matter and doesn't travel very far, less than a beta particle. But if, indeed, it hits a cell, it will probably kill it, and if it doesn't kill it, it will definitely damage it. That's why alpha emitters—and plutonium, in particular—are the most carcinogenic or cancer-producing substances we have ever known. And plutonium is man-made. It didn't exist before we fissioned uranium. It is appropriately named after Pluto, the god of Hell, because it is incredibly carcinogenic.

Plutonium is an interesting metal. If it is exposed to air, it ignites spontaneously, forming tiny aerosolized particles which can be breathed into the lung, and can give you lung cancer.

Now, how does radiation produce cancer? Your body is composed of millions and billions of cells—there are hair cells, eye cells, liver cells, heart cells. Inside each cell is a nucleus, and inside the nucleus are long string things, and arranged on the strings are the genes—the DNA. Well, these DNA molecules are the very essence of life: they control every single thing about us. Everything is passed down from generation to generation.

Now, in every cell in the body, there's a regulatory gene which controls the rate at which that cell divides. And if you have an atom of plutonium sitting next to a cell, giving off its alpha particle, and the particle hits the regulatory gene, it will damage it, but the cell will survive. The cell will sit dormant for about fifteen years. (We don't know why this happens at all.) And then one day, instead of just producing two daughter cells when it divides, as a cell normally does, it goes berserk and produces millions and

billions of cells. That is a cancer.

So if you inhale one atom of plutonium into your lung and it emits one alpha particle, which damages *one cell* and *one gene*, that can kill you, you see, because that produces millions of cells, which is a cancerous tumor. Then one cell will break off and go up to your brain and produce another tumor. Another cell will break off and go into the blood to your liver and produce another tumor, a secondary tumor. This is called secondary or metastatic cancer. These are very virile cells. They tend to live at the expense of the normal body cells, so the body dies.

Now, plutonium is so toxic that people who've worked with it say they can't find a low enough dose which won't give every dog they put it into lung cancer. Now, that's not normal in medicine. Usually there's a threshold in a drug, below which it does no harm and above which it does have an action. It is generally accepted that a millionth of a gram of plutonium will give you cancer. A gram is a minute amount; a millionth of a gram is something you can't even see. Now, by extrapolation—and this is hypothetical—if you could take a pound of plutonium and put a little piece into every single person's lung on earth, you'd kill every man, woman, and child on earth with a lung cancer. You couldn't do that, but that's how dangerous it is.

Each nuclear reactor makes 400–500 pounds of plutonium every year. By the year 2020, in this country, they will have made 30,000 tons of it. It only takes 10 pounds to make an atomic bomb. That means that, theoretically, any country that has a nuclear reactor could make forty atomic bombs every year if they



"...If you have a nuclear reactor, your enemy doesn't need a nuclear bomb..."

could extract the plutonium. By the year 2020 there will be 100,000 shipments of plutonium transported along the highways of this country annually. Now, plutonium's worth more than heroin on the black market, because it's raw material for atomic bombs. And already trucks with valuable cargoes disappear.

Let me tell you about the half-lives of radioactive substances. Radioactive iodine 131, for example, has a half-life of 8 days. That means that if you start off with a pound of it, in 8 days you will have $\frac{1}{2}$ pound; in 8 more days you will have $\frac{1}{4}$ pound; in 8 more days you will have $\frac{1}{8}$; et cetera . . . It decays like that. So radioactive iodine is dangerous for a couple of weeks. That's why, after fallout, if you store milk or dry milk for a couple of weeks, it's safe from radioactive iodine contamination.

Strontium 90 has a half-life of 28 years. That means it's dangerous for several hundred years. Cesium has a half-life of 33 years—about the same as strontium. Plutonium has a half-life of 24,400 years. That means it's not safe for half a million years. And it is not biodegradable; you can't get rid of it. And they don't know where to put it; they haven't solved the waste storage problem. But they say, "We're scientists. We'll find the answer. Have faith in us." That's like my saying to a patient, "I'm sorry, I've just diagnosed that you have cancer of the pancreas. You'll probably live for six months, but have faith in me. I'm a doctor, I'm pretty smart, and in twenty years' time I may have found a cure." That's insane!

We're talking about a substance that is so incredibly toxic that everybody who comes in contact with it and gets it into their lungs will die of a lung cancer. You don't know you've breathed it into your lungs. You can't smell it, you can't taste it, and you can't see it. Nor can I, as a doctor, determine that you've got plutonium in your lungs. When a cancer develops, I can't say that cancer was made by plutonium. It doesn't have a little flag saying, "Hey, I was made by plutonium." And you'll feel healthy for fifteen to twenty to thirty years while you're carrying around that plutonium in your lung, till one day you get a lung

cancer.. It's a very insidious thing. We have to teach people that it takes a long time to get the cancer. If I die of a lung cancer produced by plutonium, and I'm cremated, the smoke goes out of the chimney with the plutonium, to be breathed into somebody else's lungs—ad infinitum for half a million years.

When the uranium is fissioned, every year they remove about a third of the radioactive rods from the nuclear reactor core. And they're very hot, thermally and radioactively. Each rod is so radioactive that if you put a single rod on the ground and you drove past it on a motorbike at 90 miles an hour, it would kill you by intense radiation emission. They're being stored in big ponds beside the nuclear power plants. The ponds are getting full. They have to be packed set apart, because if they get too close, they could melt down—melt right through the bottom of the container and into the earth.

If there is a melt-down in the nuclear reactor, if the cooling stops working, the whole reactor core melts right down through the bottom of the reactor, half a mile into the earth. That's called "the melt-through-to-China syndrome." But inside each nuclear reactor is as much radiation as in a thousand Hiroshima-type bombs. And if there's a melt-down, a tremendous amount of steam will be liberated. It will blow the reactor container vessel apart, and that radiation will escape. So it's like having a thousand Hiroshima-type bombs around if you live near a reactor.

There are two reactors near New York, called Indian Point No. 1 and No. 2, which are terribly dangerous. If one of

them burst open and there was a melt-down (and that's a possibility), thousands of people would die instantly. Two weeks later, thousands more would die from what's called acute radiation illness, where all the rapidly dividing cells of the body die. It was described after the Hiroshima bomb dropped: the hair falls out, the skin sloughs off in big ulcers, you get vomiting and diarrhea, and your blood cells die. So you die of infection and/or bleeding—like you die when you have leukemia. Five years later there would be an epidemic of leukemia. Fifteen to forty years later, there would be an epidemic of cancers—breast, lung, bowel, et cetera. Generations hence, there would almost certainly be increased incidences of genetic and inherited diseases.

So that's the sort of thing you're putting in each city around this country. If you've got a nuclear reactor in your city, your enemy doesn't need a nuclear bomb anymore; all they need to do is drop a conventional weapon on your nuclear reactor. If Europe had been populated with nuclear reactors in the Second World War, it would be still uninhabitable right now. That's the scenario we're setting up.

Now, these rods are taken, and they're melted down in nitric acid in a reprocessing plant. And what they plan to do, if they go ahead with breeder reactors (Carter says no at this stage), is to remove the plutonium in pure form from the nitric acid and leave all the other two hundred or so elements inside the nitric acid. They've got quite a lot of big containment vessels with this material scattered round the country from the weapons program, when they removed the plutonium. That's how they got the plutonium to make the nuclear bombs, and they've left all this other stuff behind, and it's leaking.

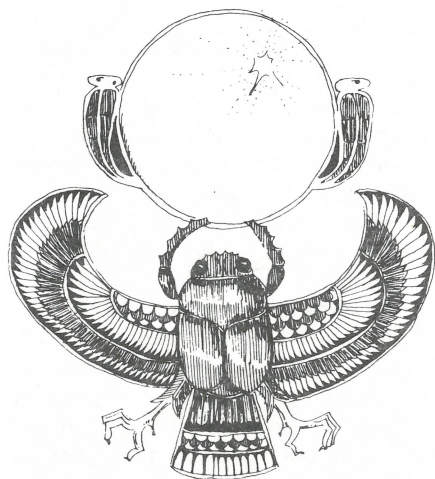
In Hanford, Washington, two years ago, they lost 115,000 gallons of highly radioactive waste containing all these elements. It's a couple of hundred feet above the Columbia River, which supplies the water to a lot of the cities there. What happens when it gets into the water? Well, all of these things are concentrated in the food chain. They're concentrated thousands of times in fish,



"...We had a slogan in Australia: 'Uranium is thalidomide forever'..."

and fish swim thousands of miles.

In San Francisco Bay, at Fellon Islands, they have just discovered that there are 45,000 55-gallon drums containing plutonium and other stuff, which were dumped there by the military, and a third to a half of them are ruptured and leaking. And that's where they catch their fish for San Francisco—from the Bay.



There's another area in West Valley, New York, where there are 600,000 gallons of high-level waste where a plant was run very cheaply, and because they didn't have really good stainless steel to contain the stuff, they turned the nitric acid into a base by adding salt. All the radioactive elements precipitated to the bottom, and it's lying in a big sludge on the bottom. The company went bankrupt and they handed the facility over to New York state, saying, "We can't look after it anymore." The state can't look after it either, and they're very frightened that that stuff will go critical. If it goes critical, there will be an atomic explosion, and Buffalo will go, along with the other cities surrounding it. If it leaks into Lake Erie, there is not enough water in the lake to dilute the waste to safe levels. A congressional committee has been given a million dollars to investigate the matter—just to investigate it: they don't know what to do about it. They don't know what to do. It's so terribly radioactive, you can't go near it. And I heard on the news the other night that the congressional committee said that the problem at West Valley is a gargantuan problem, and time is the

essence. It wasn't written up in the press the next day—I think because it's so scary, they don't want to alarm the public. So that's the situation right now.

The radioactive material that leaks out gets into the food chain. It gets in the grass and gets eaten by animals, and then into the milk, the meat, and the vegetables we eat. And it's concentrated in breast milk as well, human breast milk, and remember, babies are terribly sensitive to these effects.

Once radioactive material gets out into the environment, you can never get it back. Time and again there will be a report of a leakage or a spill in the *New York Times* or something like that, and they'll say, "Don't worry, it's perfectly safe." They don't explain that it gets into the food chain and is concentrated there. They don't explain that it takes fifteen years to develop cancer. They don't explain that babies and children are terribly sensitive to the effects. They don't tell you any of that. They just say, "Don't worry, it's safe."

If a baby drinks milk with radioactive iodine in it, it gets absorbed through the gut, goes up to the thyroid gland in the neck, where it concentrates, and it irradiates just a few cells, and one day that child may get a thyroid cancer. Strontium 90 works like calcium and is absorbed in the gut, goes to the bone, where it can produce an osteogenic carcinoma—like Teddy Kennedy's son had. They're very lethal. It also produces leukemia, because the white blood cells are made in the bone marrow. A white blood cell, irradiated by strontium 90, may divide uncontrollably some years later, and produce cancer of the white blood cells—leukemia. Cesium concentrates in muscle, and muscle is all over the body.

Now, plutonium is not absorbed from the gut, except—ironically—in the first four weeks of life, because then the gut is so immature, it can't prevent the plutonium getting through. However, by breathing, it is absorbed through the lungs and will concentrate in the liver, producing liver cancer. It will go to the bone and produce, again, an osteogenic carcinoma, and/or leukemia.

You see, the body handles plutonium

like iron. The body is tricked and, thinking plutonium is iron, it combines it with the iron-transporting proteins, so that it crosses the placenta, the organ that supplies the blood to the developing fetus. All of the fetus's organs are formed in the first three months after conception; after the first three months, the baby just grows in size. So if a piece of plutonium lodges in that fetus and kills the cell that is going to make the right half of the brain, the baby will be born deformed. Or if it kills the cell that will make the septum of the heart, the baby will have a hole in its heart.

We had a slogan and bumper sticker in Australia that said, "Uranium is Thalidomide forever." Remember that drug that women took for morning sickness, and the babies were born very deformed? They had hands sticking out of their shoulders, et cetera. That's what plutonium can do. But, worst of all, it's concentrated in the testicles and the ovaries, where it can damage the eggs and the sperm, and hence the genes. If a gene is damaged by plutonium, in a dominant mutation, the baby may be born deformed. If the gene is damaged in a weak way, the baby will look OK, because its normal gene is the strong one, but it will carry an abnormal gene.

We all carry abnormal genes. For example, cystic fibrosis, the most common inherited disease of childhood, is controlled by a weak or recessive gene. One in twenty people carries that gene. It's very common. We all carry several hundred nasty genes, and we don't know we carry them until we marry someone with the same gene, and the two genes get together to produce a child with that disease.

Now, because of the background radiation from the sun, we've had mutations or changes in the genes which have allowed fish to develop lungs and birds to develop extra wings, and the bad mutations have died. Now doctors are so smart, they can keep people with bad mutations (like diabetes and other diseases) alive to reproduce—because we believe in life. However, this will cause a gradual genetic degradation of the human species. But to have an industry that is going to increase the incidence of genetic diseases and

deformed babies by producing plutonium seems to me *wicked*.

Geneticists say that we probably won't live to see these effects of genetic disease, because these things are all so carcinogenic or cancer-producing that we'll all probably die of cancer before then. Scientists predict epidemics of cancer and leukemia in young people. We may have to get used to living only twenty or thirty years instead of seventy or eighty years. I'm scared stiff that we probably won't survive to the year 2000. Some of the greatest brains at Harvard say our chances of surviving to the year 2000 are less than 50 percent, because this country has enough weapons to overkill Russia forty times, and Russia has enough weapons to overkill this country twenty times. And if a nuclear war occurred, the whole of the human race would not survive. There's no way we could survive a nuclear war. Even if there were a few survivors, the water and air would be so contaminated, they'd get leukemia and cancer later.

Nuclear plants are synonymous with nuclear weapons. Nuclear power plants are becoming unpopular in this country for obvious reasons. People are saying, "I don't want one in my city." But GE and Westinghouse keep making them: you know, if you have a product, you've got to sell it. So they're saying to the Third World countries, "Say, would you like to buy a nice nuclear power plant?" And they say, "Well, we don't have enough money." And the companies say, "We'll lend you the money." The more countries that get nuclear power plants, the greater chance that there will be a limited nuclear war somewhere in the world, and that could precipitate a global confrontation.

Now, we all know that the man who had control of the black box several



years ago in this country was not completely stable. Brezhnev is apparently being treated with Cortisone, a hormone that can produce acute psychosis. Obviously, he is in charge of the black box in Russia to a degree. We are none of us completely sane and stable all our lives. We're all fallible. We're only human. Yet we're dealing with weapons and industries of such magnitude that human beings can't handle them. And they will be used unless we get rid of them.

I would contend that nuclear power is not medically indicated; neither is nuclear war—it kills people. I'm here to look after people, to save people's lives, not to kill them. I can't understand the psychology of government people saying, "Oh, we'll have a limited nuclear war." Or the psychology of the people who build these things. If you were a psychiatrist sitting on Mars, looking down on Earth, you'd say, "The world is being run by lunatics!"—that is, if you were for life and not for death.

What these people seem not to realize is that they won't live either. Most of us, I think, don't like to think about our own death, because it's too scary. We sort of deny that we'll ever die. I think particularly of those politicians who have probably never even seen a person die. They've never seen children, age twelve, coming into a hospital, looking slightly pale, with a few bruises, to have a blood picture done, and they've got leukemia, and they're put in an isolated ward all by themselves. And their parents suddenly appear in a gown and a mask. Nobody tells them what's the matter. They have some strange drugs which make them feel funny. They live in a state of abject terror and ignorance for two weeks, and suddenly they die from a hemorrhage from their nose or mouth. These politicians have never seen the grief of the parents, with their beautiful children dying. Have they ever seen or witnessed anything like that? Because if they had, they wouldn't be doing this, unless they were psychotic.

Unless we get rid of all these nuclear weapons, we probably won't survive. It seems such a pity. It's taken billions of years for us to evolve, and we're capable of such great love and fantastic relationships and great creativity and fantastic art. We're a *magnificent* species. Yet we're so smart, we've learned how to wipe out the whole of life on earth. And we seem to be heading in

that direction, like lemmings.

We are the curators of life on earth. We hold it in the palm of our hand. We're at the crossroads of time, right now. If nuclear power plants proliferate in this country and throughout the world, so will nuclear weapons. If we don't get rid of nuclear weapons, we won't survive. Neither will the animals and plants, because what radiation does to us, it does to them: it gives them cancers and produces deformities in them.

So you see, it is imperative that we rise up, each one of us, and take the load on our own shoulders—and not just with money (which is important), because that won't do. That's not enough. We all have to do what I did in Australia and say, "I have to take this responsibility." We've got to rise up for our children and save the human race.

I'll tell you what's happening in Australia now. The present government which is very conservative, wants to export uranium. Recently, 30,000 people marched in Melbourne, and 350 were arrested. The Australian labor party, which is now in opposition but could become government soon, has just passed a resolution for an indefinite moratorium on mining uranium. And if the party does get into government, it will cancel all international uranium contracts that the present government is drawing up—which makes business and multinationals very wary. The whole of the Australian trade union movement has said that if the government doesn't agree within two months to hold a referendum within one year, it won't mine any uranium at all.

So you've got to teach people the facts. I find that once people understand what is happening to their world, they decide to act. It's no use immunizing your kids, giving them a good education, loving them, when they probably haven't got a future. It's our total responsibility, as parents and grandparents, to allow our children and our grandchildren and our descendants to have the potential of a fruitful and full life.

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