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From: dave@ratmandu.esd.sgi.com (dave "who can do? ratmandu!" ratcliffe)
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16 Million Radiation Deaths and Counting

. . . the number of children and grandchildren with cancer in their bones, with leukemia in their blood, or with poison in their lungs might seem statistically small to some, in comparison with natural health hazards, but this is not a natural health hazard—and it is not a statistical issue. The loss of even one human life, or the malformation of even one baby—who may be born long after we are gone—should be of concern to us all. Our children and grandchildren are not merely statistics toward which we can be indifferent.

— President Kennedy, June, 1963

The following excerpts, from a talk (starting 5 pages hence) given in L.A. in 1989 by Dr. Rosalie Bertell, President of the International Institute of Concern for Public Health based in Toronto, Canada, articulates some of the history and medical consequences of the new "fire" (nuclear energy) we as a species have begun to "play with" since the 1940s. The talk was in the form of a slide presentation. Although we cannot "see" the slides, the information presented is rich in detail and insight about this unique crisis confronting us and our planet.

This issue of radiative pollution—from nuclear testing fallout, from the routine emmissions of nuclear (commercial or military) reactors, from the billions of tons of uranium tailings left exposed at sites around the globe, from the massive amounts of low level and high level radioactive waste generated every year for decades from hundreds of commerical, military and research reactors around the globe—far from being the "passe" story the industry’s PR hacks and media assets constantly present it as, is the number-one problem our children, grandchildren, great-grandchildren, great-great-grandchildren, ad infinitum, will have to deal with for at least the next 240,000 years. The damage to the integrity of the gene pool is still being assessed as well as increased. And all this has happened in less than the past fifty years. The challenge is paramount. Denial promises extinction of all our relations.

— ratitor

The solid waste that’s left in the [nuclear power] plant, that they don’t just release, they put into trenches and bury them. This is a waste dump on the Columbia River. They just bury it in the trenches, there is no containment whatsoever. Next.

This was part of the Manhattan Project and I don’t know if you can read the sign but it says "Don’t Go Beyond Here Without A Respirator." Now that chain fence is certainly a great protection. This is Canonsburg, Pennsylvania where they processed the ore from Zaire—which used to be called the Belgian Congo—this was for the Manhattan Project. They also used Canadian ore. And they processed it here and they built a big lagoon for the waste, and it would never grow anything. It was just a barren piece of land. And you’ll never guess what they decided to use it for since it didn’t grow *anything*—even weeds. They used it as the baseball diamond for the kids.

When they passed the superfund legislation, this was number one on the list of places to be cleaned up on the superfund. So they moved the baseball diamond away and they put up this chain-link fence, and they put up a big sign "Don't Go Beyond Here Without A Respirator," and then decided they'd start cleaning up. I understand it's a partial cleanup.

When I was on the committee for the Environmental Protection Agency they had identified seventy-four *thousand* toxic waste dumps in the United States. They had rated thirty-two *thousand* as severe health hazards, and this was number one on the list. Next.

Some of the waste makes its way into barrels and the barrels have an expected lifetime of thirty-five years. Most of them leak before that. The stuff they put inside—these radioactive materials—many of them have half lives of hundreds of thousands of years. . . .

. . . the military began—even before Micronesia was given to the United States as a Trust Territory—a *year* before that—they were testing bombs. And what happened from the people's point of view were these artificial sunrises. Next.

Then in the rain that followed the radioactive fallout came down. On March 1st, 1954 they set off the first fifteen megaton bomb and the fallout came down on the Rongelap people who were about 150 miles away. Next.

This is a Rongelap child and that is a severe burn on the head where the fallout landed. These are beta burns. The people had suffered a *very* high dose of radiation and were *very* sick. They were not evacuated for seventy-two hours although the military ships had been warned and moved out of the area. They didn't warn the people. . . .

These effects of radiation were *very well known* in 1945. It was not obscure research but it was a Nobel prize that showed the genetic effects of radiation. The Nobel prize was given in 1943. So this was not obscure.

The implications of it, though, I think have not yet been comprehended because what we're doing here is two things at the same time. We're damaging the life-support system—the air, the water, the food, the land—and at the same time, we're damaging the gene pool or the children. So we're producing people physically less able to cope, and we're giving them more to cope with. And that's a death process. And that's what I'm trying to talk about. That in the *long-term,* we are killing ourselves as a species. Next.

The damage is invisible, and it's not immediate. It's mostly cell damage and the insidious part of it is, it's the cells that are *slightly* damaged and left alive that will give us the most trouble. Because *they* show up as a deformed baby because the ovum or the sperm was deformed. Or if it's a cell in the lungs, or in some other part of the body, if it's left *alive* and damaged, it can produce a cancer. Cancer is not produced by *dead* cells. So at high doses you do a lot of tissue damage and you kill cells which don't cause as much cancer as you do at low doses where you leave the cell alive, you damage it, and it reproduces itself abnormally. . . .

Much of what I've been showing is documentation of a very extraordinary societal addiction. It's an addiction which is self-destructive, it's *wildly* excessive and it's eating up the resources, both the brain drain and the money drain, and it's also created a situation where the *victims* are afraid to confront the people that are carrying out this addiction. And we all seem to be caught in it. We're caught in it in one way or another either as passive cooperators or as addicted. But we're working together to produce a society of death instead of a society of life and we don't *have* to do that, we can change. . . .

This is a graph that was prepared by the unions because when they got a military contract they knew that the numbers of jobs went down. It was not a help and what they discovered, or the way they went at it was to say If you had a billion dollars, how many jobs could you create? And they found that in the military you could only create 70,000 while in mass-transit the same billion dollars would have brought 90,000, in construction you could have had 105,000 jobs, daycare 120,000, medical care 140,000, education 180,000.

The question is *not* Do you want jobs? but What kind of jobs do you want? You get the *least* number of jobs for your money in the military and you get the *least* payback into society because *none* of the things are usable—I hope. So there's little or no return unless you want to *further* starve the developing world by trying to sell your weapons to them. But *certainly* they're not a market for the nuclear. . . .

Q: This one says, The government says that we need to have nuclear power or else the U.S. will be at a loss for energy because of our massive consumption of power. What feasible replacement could be used instead?

RB: I would sure love to know how much power the military is using. I'd like *all* of it. *All* of it, including the *massive* amounts of fuel used for these planes. I remember when we had the campaign against the B-1 bomber: finding out that *one* B-1 bomber used in *one* year as much fuel as would be comparable to running the mass transit systems in the ten largest cities in the United States. There's something wrong with our energy system when it's not the *people* who are using the energy. I see more energy use in *Europe* and they're supposed to have *lower* per capita energy than the United States.

That's my first thing—I'd get rid of that. Then I think the question has to be examined, Whether or not *all* energy has to come from electricity? What we've been *told* is we have to have electricity. You could actually pick up *seventy percent* of your space and water conditioning immediately with solar. There's no reason to say you have to go solar, solar electric and then space heating or air conditioning. They have wonderful direct solar air conditioning in Australia in Darwin. Every house has it. So we have *lots* of things we can do, the problems are in our head.

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'Days Are Not Important Unless They Are Good Ones'

In the dim night light of a hospital room, seven-year-old Jimmy was remembering the day on which he was told he had leukaemia. He remembered his mother's tears, his father's bewildered anger, the alien feeling of the hospital environment. Then his mind replayed the nausea and diarrhoea caused by radiation therapy and chemotherapy, his hair falling out and kids laughing at him, all the highs and lows over the last eight months' battle with a disease which was now demanding his total attention. Then he knew his answer, and, mentally relieved, fell into a peaceful, refreshing sleep.

Later that morning, when all the hospital ablutions were concluded, Jimmy's mother and father arrived with Dr K. whom Jimmy had learned to love and trust. After the usual greetings and kidding around which had come to be a ritual, helping them all to cope with the tragic situation, Jimmy broke his news with unusual conviction and seriousness. 'I don't want to try the new medicine. It will only give me more days, and I'll die anyway. Days aren't important unless they're good ones.'

The doctor quietly prepared for Jimmy to go home, counselling his parents on supportive medical care and assuring them he would be available for all possible emergencies.

Jimmy died at home, surrounded by familiar objects, loving parents and a younger brother who couldn't understand what was happening. Jimmy died gently, utterly exhausted by having lost so much blood. His tissue had broken down completely, and he was bleeding from every body opening. His bed looked like a battlefield.[1]

This story about Jimmy is related to the subjects of national defence, economic development and energy policies. Leukaemla is related to exposure to benzene[2] (a petroleum derivative), microwave radiation,[3] X-ray and nuclear fission products (radioactive chemicals emitted from nuclear-related industries).[4] These in turn are part of strategies for national growth and development, as well as advances in the art of war. Energy mix and a weapon strategy inseparably involve human consequences in terms of increased incidence of leukaemia, other cancers, neonatal and infant mortality, mental retardation, congenital malformations, genetic diseases and general health problems.

Omnicide: The Stark Reality of Species Death

The acceptance of the fact of one's personal death is mitigated by the experienced continuity with both the past and the future. For adults this continuity is most obviously linked with biological parenting, but it also occurs because of human memory, culture, literature and scientific endeavours. One can continue to affect history even after one's death. Parents survive through the cherishing memories of their children. Personal death is natural, although it may be premature as Jimmy's was, or violent as in war.

The concept of species annihilation, on the other hand, means a relatively swift (on the scale of civilization), deliberately induced end to history, culture, science, biological reproduction and memory. It is the ultimate human rejection of the gift of life, an act which requires a new word to describe it, namely omnicide. (The term omnicide was first used by John Somerville in 'Human Rights and Nuclear War', *The Churchman*, 196: 10-12, January 1982.) It is more akin to suicide or murder than to a natural death process. It is very difficult to comprehend omnicide, but it may be possible to discern the preparations for omnicide and prevent its happening. . . . Should the public discover the true health cost of nuclear pollution, a cry would rise from all parts of the world and people would refuse to cooperate passively with their own death.

— from *No Immediate Danger, Prognosis for a Radioactive Earth*
by Dr. Rosalie Bertell, (c) 1985 by The Book Publishing Company,
Summertown, Tennessee 38483

1. This is a typical leukaemia death, with tissue breakdown and massive internal haemorrhage. Dr Elizabeth Kubler-Ross—well known for her counselling of the dying—often uses a similar story to stress the importance of home care for the dying. Jimmy is a ficticious name, but this is the story of a real child treated at Roswell Park Memorial Institute in Buffalo, New York, USA.

2. U. Saffiotti and J. K. Wagoner (eds). "Occupational Carcinogenesis," Annals of the New York Academy of Science, ANYAA9-271-1-516, New York, 1976.

3. 'Biological Effects and Measurement of Radio Frequency/Microwaves,' Symposium Proceedings, US Department of Health, Education and Welfare, HEW Publication (FDA) 77-8026, 1977. Available from the World Health Organisation, United Nations.

4. 'The Effects on Populations of Exposure to Low Levels of Ionising Radiation,' Report of the Committee on the Biological Effects of Ionizing Radiation (BEIR), 1972. Revised in 1979; revised again in 1980.

16 Million Radiation Deaths and Counting—Why should we continue to destroy ourselves by this kind of mentality and this kind of process?

Dr. Rosalie Bertell speaking at an event in Los Angeles put on by Women's Action for Nuclear Disarmament (WAND) and Women's Strike for Peace (WSP) March 11, 1989

It's nice to be here. I've been to California before and I've spoken to audiences here before. I think things have changed. I guess it's twenty years now since I started to look at the soft underbelly of the whole military complex and I started to see that our way of surviving—our strategy for surviving—was killing us and killing everybody else. It's like a death machine. And I do think much of it has been unmasked.

The year 1988 marked a turning point when *Time* magazine was willing to go out on a limb and expose the weapons labs. Probably you saw that issue there where they exposed what was happening at Savannah River, at Fernald, Ohio, at Rocky Flats in Denver, and up at the Hanford reservation. There are many other places like that. Not only these, but this has been going on now for a long time.

So I think the motivation is what I'm concerned about tonight. When you think everything's alright, you think you have a lot of time to get it together and decide what you're going to do and plan strategies or even just forget about it because things are okay the way they are. And the government would like us to think we've had peace since 1945 but that's a lie. It's been a time of tremendous surrogate wars and upheavals and wars against our own people because that's what killing is about.

So the topic I'd like to deal with tonight is why should we continue to destroy ourselves by this kind of mentality and this kind of process? I'd like to unmask a little bit of it. So maybe it we could have the first slide.

This a picture of the Rio Algom uranium mine. Uranium mining is mostly done on indigenous people's land. In the United States we do it on the Navajo and Hopi land. We tried to do it up in the Black Hills in the land of the Lakota. It's done on Ojibwa land in Canada. Rio Algom is up near the Serpent River reserve. This particular uranium mine is just north of Lake Huron and the Georgian Bay. It's just one of many but I thought maybe a few pictures would tell you a little bit about what a uranium mine is like.

The destruction of the environment caused by a uranium mine is quite unique. If you take all the rock that's mined out of the earth, the only part that's usable is .03 percent. So 99.97 percent of it is waste. Next.

This is one of the plants where the ore is refined. They mine a lot of hard rock, less than six percent of it is ore. Then that ore is sent to a mill and less than 0.05 percent of that ore is used—turned into uranium. The other elements that occur with uranium in nature are radium, thorium, radioactive lead, bismuth and polonium. So you're talking about concentrated radioactive waste left at the mine site. Next.

This is a worker from Paducah, Kentucky, from Union Carbide. You wouldn't know but he was fifty-two years old when this picture was taken. He gave me a list of the men hired with him and the numbers that died of cancer. It was between sixty and seventy percent of the men hired with him. Next.

This is one of the uranium tailings piles. And that large artificially produced mountain there on the right is all radioactive material. Now when it was under the ground in rock form it really was not that hazardous. It's now crushed so it's much more bioavailable. It washes down in the rain, it gets into the water, the irrigation and the food chain. It also releases the radioactive gas, radon, which can travel quite a distance from the pile. It requires six feet of dirt and clay to prevent the migration of that radon gas out of the pile. Most piles are not covered at all. Next.

This is another uranium tailing pile. It's also mixed with sulfuric acid. They use sulfuric acid to leach out the uranium. This is in the beautiful Canadian north. If you look down from an airplane you see the ground looking like this. This is *not* snow. Next.

Now this debris, which was under the earth, is lifted out of the earth and it gets into the whole ecosystem. It travels quite great distances because if it dumps into, say Quirk (sp?) Lake by Elliot Lake, it goes right down into the Great Lakes and the whole water system out the St. Lawrence River into the ocean. It gets into the currents, it goes up into Greenland, the North Sea, Norway. It's apt to end up anywhere. Next.

And eventually it gets into the food supply. Often people ask me where should they live and I usually say where does your food come from? Next.

We're now able to ship the food all over the world. So Wisconsin cheese is eaten in Europe; you go to Malaysia and you find California oranges. Next.

Now we've taken this uranium out of the ground because it fissions; because it releases a tremendous amount of energy. This happens when the uranium spontaneously gives off a neutron. It goes through a moderator, usually water which just slows it down a little bit (that's what those lines are), and then it hits another uranium atom and breaks it into smaller particles.

This *doesn't happen* in nature because the uranium is so scarce that there's not another uranium atom nearby when it splits. So in order to get this to happen spontaneously you have to get enriched uranium which is concentrated uranium-235 so there's another atom close enough so they can get a chain-reaction going.

Now when you split that uranium you get two chemicals lower on the chemical chain, or smaller, and they occur in radioactive form. Next.

What has happened now between the fissioning, or the breaking of an atom, and between releasing of neutrons that then go into the other surrounding chemicals in the environment, we have created between 400 and 600 radioactive chemicals—the whole chemical chart, all of our ordinary chemicals, but in radioactive form. And when we say they're radioactive, we say they're unstable. That means in the nucleus of the atom there are periodic explosions that give off an alpha particle or a beta particle or a gamma ray.

Gamma is like X-ray, it's energy, photon energy, wave energy. A beta is an electron. It's an electrically charged particle, extremely small, that comes off at a very explosive rate. And an alpha particle is very large—it's about 700 times bigger than a beta particle. It has double electrical charge. If you were a cell, a living, small cell, it's like a cannon ball. It does a tremendous amount of damage but in a very short track because it's big.

Now we've created these chemicals and released them into our air and water and food and land. Next.

This is a nuclear power plant, this particular one is the Pickering plant on Lake Ontario. Inside of a nuclear reactor we do this fissioning in a controlled manner and we produce all of these chemicals, some of which are contained and some of which are released.

When you produce these between 400 and 600 chemicals they're in all different physical states so some are gasses, some are liquids, some are solids. The gasses produced are all released. It's not a *closed* system. So routine operation releases all of the radioactive gasses. Some gasses are held back because they decay into a radioactive solid. They get rid of *all* liquid waste. It's dumped into the local river or lake and the only thing there's any *attempt* to save is the solids. Next.

This is a *New York Times* cover which tried to say, We can handle the "peaceful atom," so you stand behind a lead door and leaded glass and use remote control equipment. However in the real world—next slide:

people go in and have to run these things. If you've ever had a chest X-ray, you know that that cloth jumpsuit doesn't stop gamma rays. You could get a chest X-ray and the zipper would show, but it would go right through the cloth. If you notice he also has partial respirators. A gas will go right through a respirator. It'll keep out some of the solid particles but it's not going to keep gasses out. So while you can do some *partial* protection for workers, you cannot totally protect them from the exposures in this industry. Next.

Besides that, the radioactive chemicals that are released get out in four different ways to the general public. The first way is through the stacks—not the cooling tower—but the stacks of the plant. Released into the air, often in gaseous form, which after it's out in the cold air, decays into a solid and is deposited in the clouds. And then when it rains or snows it comes down picked up by the plants and then again gets to the human table—we eat them.

The second way is the liquid effluence which comes via the fish and the algae. You can also pick it up directly through your skin—absorbed through the water—if you're swimming, or if you're boating—anything that's gaseous that's dissolved in the water is released from the surface and you can breath it.

The third way it gets to people is through the fuel transport in and out. People who live along a transportation route are assumed automatically by the U.S. Nuclear Regulatory Commission to get the equivalent of two or three chest X-rays a year—just if you *live* along the transportation route. That means no accident, no stopping, no nothing.

The fourth way is direct exposure from the plant. The plant over time becomes radioactive. The pipes become radioactive, the building becomes radioactive. And if they store the spent fuel rods on the plant then you can measure that outside of the plant. You can measure the buildup of fuel rods. We've done it. There's one plant in particular, the Vermont Yankee, where the plant itself became so radioactive they had to put a second cement wall around the containment in order to prevent the gamma rays from going down to a school at the foot of the hill. They were measurable *inside* the school. Next.

Now these chemicals, when they're out in the water and the food and the land, the body can't tell the difference between these chemicals and ordinary nutrients. So it will treat the cesium as if it were potassium and it treats strontium-90 as if it were calcium and stores it in bone. So it goes to different organs in the body. That's why the radioactive iodine is *so dangerous* because you store it in the thyroid gland. So then those small explosions take place *inside* the body, *inside* these organs which are so important. Next.

The solid waste that's left in the plant, that they don't just release, they put into trenches and bury them. This is a waste dump on the Columbia River. They just bury it in the trenches, there is no containment whatsoever. Next.

This was part of the Manhattan Project and I don't know if you can read the sign but it says "Don't Go Beyond Here Without A Respirator." Now that chain fence is certainly a great protection. This is Canonsburg, Pennsylvania where they processed the ore from Zaire—which used to be called the Belgian Congo—this was for the Manhattan Project. They also used

Canadian ore. And they processed it here and they built a big lagoon for the waste, and it would never grow anything. It was just a barren piece of land. And you’ll never guess what they decided to use it for since it didn’t grow *anything*—even weeds. They used it as the baseball diamond for the kids.

When they passed the superfund legislation, this was number one on the list of places to be cleaned up on the superfund. So they moved the baseball diamond away and they put up this chain-link fence, and they put up a big sign "Don’t Go Beyond Here Without A Respirator," and then decided they’d start cleaning up. I understand it’s a partial cleanup.

When I was on the committee for the Environmental Protection Agency they had identified seventy-four *thousand* toxic waste dumps in the United States. They had rated thirty-two *thousand* as severe health hazards, and this was number one on the list. Next.

Some of the waste makes its way into barrels and the barrels have an expected lifetime of thirty-five years. Most of them leak before that. The stuff they put inside—these radioactive materials—many of them have half lives of hundreds of thousands of years. Next.

This is the so-called "tank farm" at Hanford. I don’t know if you can see what look like round disks—they look like puddles of water or something—but those are the tops of underground tanks which are full of radioactive liquid waste. They’re not even sure of what’s in each one of those tanks. I think there are 147 and at *least* a third of them have already leaked. They can’t get them out of the ground and they’re not sure what’s in them and they’re afraid to concentrate them because the sludge contains plutonium which might become critical. So this is the tank farm which now replaces the desert up in Hanford. Next.

This is a so-called "low level" radioactive waste site. This is radioactive garbage. Again notice the chain-link fence. You see most of this releases dust and fumes and it carries in the wind. So you live thirty miles away and you don’t *see* it, but you still get the effects. Next.

This is the way the British get rid of their waste. In the back is the Windscale plant and these are two big pipes. They come right out of the plant and they go out into the Irish Sea. And they send the waste down this pipeline. They had this pipe dream that the waste would go down into the bottom of the Irish Sea and stay there. They said it was very heavy waste so it would go right down and just stay on the bottom. So a few summers ago it started coming up on the beaches. You walk all along beautiful Cumbria Beach and there’s plutonium in the sand. They have epidemic of leukemia; they have children with Down’s Syndrome; they have all kinds of problems and the beaches are not being used anymore. Next.

In addition to all *this* which is considered routine—so far what I’m talking about is normal procedures and no accidents. Just in the nuclear *weapons* industry—this is not including the commercial accidents—between 1947 and 1977 there were 125 *major* accidents with releases of radiation. Most of them you’ve never heard of—they’re called broken arrows—and they’ve occurred all over the world.

One of the worst was in Spain where they spilled plutonium all over several farmer’s fields. One was up in Greenland with the crash of a B-52 with four hydrogen bombs on board. Next.

This is the hospital in Moscow—the Hospital Six when the firemen were, where several of them died where they had the transplants. The Chernobyl accident got the first global coverage of an accident at the time—well maybe the second, Three Mile Island got a lot of coverage—but with the Chernobyl accident there was much more mobilization on even a grassroots level to actually measure levels of radiation and actually see what was happening. Next.

This is one of the sheep that was condemned in England. Maybe you know that all of the sheep were forbidden to be taken to the market because a baby animal, or a baby human being, is growing at a rapid rate so when these radionuclides are around, they tend to incorporate more than an adult, in the same way that a child needs more calcium. A child will pick up more strontium-90, so will a lamb pick up more cesium and strontium-90. Next.

These are the reindeer from Sweden. They called them the "Becquerel Reindeers" because all they heard about was how many becquerels of cesium were in them. The meat inspector has a geiger counter in his hand and these reindeer set off the geiger counter. They didn’t know what to do with them—what do you do with contaminated meat? If you bury it, then the chemicals get into the land and they come up in the next crop. If you dump them into the ocean then, again, the chemicals are released and they’ll come back in the fish. They have them in a very large freezer and they don’t know what to do with them. And where do you get another food supply when your food supply is contaminated? Next.

This is a very interesting map which I got from West Germany but it was done by the Oak Ridge National Lab. And this is supposed to be the fallout from Chernobyl in the United States. Now it’s really odd—especially if it were coming in on the west coast: the rain is on the coast—not in Idaho.

I don’t know if you realize it, but there was a major accident at the Nevada test site in April of 1986 just before the Chernobyl accident. It was a hydrogen bomb explosion underground and their doors didn’t close—they’re supposed to close. They’re trying to catch the first X-ray off the hydrogen bomb for a laser weapon-beam for Star Wars. Anyway the doors didn’t close and the whole area filled with the debris from a hydrogen bomb. So the Department of Energy applied for and gave itself a license to vent the debris from the hydrogen bomb. And when they learned that the Soviet Union had an accident they vented quite rapidly from the Nevada test site. And that’s what that looks like to me.

We have actual measurements from the Burlington, Canadian station—it’s a government station and it’s over on Lake Erie and Lake Ontario. They measured the cesium and they identified it as coming from the Nevada test site—*not* as coming from Chernobyl. These look like point-sources. They don’t look like something coming from a very remote source and coming down with a rainfall that’s widespread. Next.

This picture I put in so you could see an underground nuclear explosion in Nevada. This was set off nine hundred feet below the surface of the desert. This is the Baneberry event in 1970 and in the background are the Rocky Mountains.

This is underground. There’s nothing at all in the Partial Test Ban Treaty [of 1963] that says you can’t release radiation to the air—it just says you have to put the bomb underground. In the official U.S. book telling you about their underground explosions, they list separately the ones that were deliberately designed to leak radiation to the air. This is *after* all the calls for "Ban the Bomb," and ‘you’ve got to test underground,’ and ‘stop spewing radiation into the air.’ They did them deliberately.

Also eventually the underground radioactive debris will work into the California water supply. The military has agreed that the water—the underground acquifers—will be non-potable—they’re saying fifty years. That means there’s some down there already. Next.

The Nevada test site that we are blowing up is Shoshone Land. This is the native people praying for the desert. Next.

These weapons were set off in many other places. Besides Hiroshima and Nagasaki, besides Almagordo where the first one was set off. There have been more that sixteen hundred large ones detonated—and this is not counting things that they call "safety shots" and so on. Next.

The U.S. began in 1946, right after the war, setting them off in the Bikini atoll out in the Pacific. An atoll is a chain of coral islands. And they are built around the peak of an underwater mountain. So in the center there, where the lagoon is, under the water is the peak of an underwater mountain and this coral grows around the top of the mountain. And when it gets out of the water it collects sand. These are sandy, desert islands. They're not lush islands like French Polynesia. Next.

I think they look like bullseyes. And the military began—even before Micronesia was given to the United States as a Trust Territory—a *year* before that—they were testing bombs. And what happened from the people's point of view were these artificial sunrises. Next.

Then in the rain that followed the radioactive fallout came down. On March 1st, 1954 they set off the first fifteen megaton bomb and the fallout came down on the Rongelap people who were about 150 miles away. Next.

This is a Rongelap child and that is a severe burn on the head where the fallout landed. These are beta burns. The people had suffered a *very* high dose of radiation and were *very* sick. They were not evacuated for seventy-two hours although the military ships had been warned and moved out of the area. They didn't warn the people. Next.

For about the first four or five years, people either found it impossible to become pregnant or they had miscarriages or stillbirths. Then they had babies that were severely deformed. This is a severe clubfoot. Next.

They also have a very high rate of Downs Syndrome. We did a survey of three hundred Rongelap children last year in January. Now this is, what?—1988 from 1954—you're talking about thirty-four years later out of the three hundred children there were three Downs Syndrome. Now a *normal* ratio is one Downs Syndrome out of 660 children. We had three in three hundred children. Notice also this child has no hand. That's usually a problem in the in utero—it's a congenital malformation because of toxic material.

Those atoll's are *still* contaminated. They *still* can measure the radiation in the atolls—in the food—their breadfruit doesn't grow anymore, they're not allowed to eat the crabs, (coconut crabs), the coconut trees are radioactive, the coconut meat and milk is radioactive. Next.

This was the last evacuation of the Rongelap people and I think that that woman shows how the people feel. They had to move off their atoll again in 1985 and they're still waiting to find out *if* the United States is going to clean it up. Next.

These effects of radiation were *very well known* in 1945. It was not obscure research but it was a Nobel prize that showed the genetic effects of radiation. The Nobel prize was given in 1943. So this was not obscure.

The implications of it, though, I think have not yet been comprehended because what we're doing here is two things at the same time. We're damaging the life-support system—the air, the water, the food, the land—and at the same time, we're damaging the gene pool or the children. So we're producing people physically less able to cope, and we're giving them more to cope with. And that's a death process. And that's what I'm trying to talk about. That in the *long-term*, we are killing ourselves as a species. Next.

The damage is invisible, and it's not immediate. It's mostly cell damage and the insidious part of it is, it's the cells that are *slightly* damaged and left alive that will give us the most trouble. Because *they* show up as a deformed baby because the ovum or the sperm was deformed. Or if it it's a cell in the lungs, or in some other part of the body, if it's left *alive* and damaged, it can produce a cancer. Cancer is not produced by *dead* cells. So at high doses you do a lot of tissue damage and you kill cells which don't cause as much cancer as you do at low doses where you leave the cell alive, you damage it, and it reproduces itself abnormally. Next.

I wanted to show you a few things that you can see that aren't so gross as you see out in the Marshall Islands, or if you go to the Indigenous people in the Navajo reserve, or you look downwind of Nevada. But I wanted to show you what happens in a place like Wisconsin where they have state-of-the-art nuclear power plants. These are plants that have never had accidents—we're not talking about Three Mile Island—and I wanted to show what happens on the very fragile part of the population—the babies that are born that are under twenty-five hundred grams, or under about five-and-a-half pounds. Because these babies are *very* sensitive. They are very sensitive to the environment. They often have respiratory problems and how good their environment *is*, will determine whether they survive or not.

So this time is 1963 to 1966. Notice the green areas: those are the milk-collecting stations where we had actual measurements of how much radioactive strontium, cesium and iodine, was in the milk. Those percents are the rate of infant death relative to the state rate. So up at the top there, in Rice Lake, they had a *worse* infant mortality rate—thirteen percent higher than the state rate—whereas down in La Crosse—number 4—it was six percent *lower* than, or *better* than, the state rate. That's what the minus means. Now the light-green areas later have nuclear power plants. The dark-green areas are more remote. Next.

This is 1967 to 1970 and it's the same area. But late in '69 they opened the first reactor and you can see the rate changed in La Crosse from six percent *below* the state rate to three percent *above*. Again, this is a rural area. That's peculiar in—[end of side A of tape 1 happens here.]

. . . was a very dumb place to build it in other words. If you look over on Lake Michigan, in December of 1970 they opened two reactors there. Those are each five hundred megawatt. You can see that area of Green Bay is about five percent above the state rate. And this is what it's been for the twenty years that they've kept the records. It's been four to five percent above the state rate. This is a highly industrialized area. Next.

Now this is the full-blown nuclear age. If you look at Green Bay, the reactors there, this is the first five years of brand new state-of-the-art reactors with no accident. The area there at Green Bay is now twenty-eight percent above the state rate. This is *statistically* significant. The death rate has increased whereas all over the United States generally, the rates are coming down.

The same thing happened in Eau Clair which was downwind of Minnesota. That's the Monticello plant up at the top. I don't know if you noticed that on the U.S. map earlier, but that one's on there too. That's a dirty plant that Monticello one. And then there are two down there at Red Wing. Those are each five hundred megawatt and the wind is from the west and it's going right to Eau Clair which is a rural area. And Genoa there at La Crosse—that's now up to eight percent above the state rate. These six reactors are each five hundred megawatt. The Genoa one is a fifty megawatt.

What happened here in Wisconsin in these first five years of brand new operating plants was that there were over a hundred *excess* infant deaths. These are over and above the number you would expect based on the state record. We checked out all kinds of things: the fossil-fuel plants, the wood-and-pulp industry which is in Wassau mostly, the coal-fired power plants, the chemical industry, the maternal child health care, the availability of special infant care units, of distance to the hospital, and so on. We looked at measles epidemics. We looked at anything anybody mentioned that could have brought about such an effect. But the only thing it correlates with are the *routine, permissible* gaseous releases from the power plant. Next.

I put a baby in because when I went out to the Marshall Islands, one of the women looked at me and she said, "You know, statistics are people with the tears wiped away." So I put picture in so we'd remember what we're talking about here. Next.

Now you might ask why are we doing all this to ourselves? Because basically the whole military-industrial complex is operating at such a level that the only ones who are in the dark are the American people and the Soviet people. So we're doing this to our *own* people. Which is a really strange kind of thing.

We're also wrecking the economy by what we're doing because the main product of this whole dirty industry is unusable. It's like a person decided they'd build chairs for their livelihood, but they just build chairs and put them in the garage, and they never sell any. It's pretty bad economics.

Where do they get the bottomless source of money to keep doing this? They get it from the taxpayer. And what does it result in? The rise of prices and interest rates and inflation, and all kinds of economic problems.

In fact the basic U.S. strategy against the Soviet Union is to so push the arms race and the space race that you break the Soviet economy. Because they *think* the Soviet economy will break before the U.S. economy. So it's a deliberate economy-breaking policy. And yet so many people walk around and think that the arms race produces jobs. Next.

These nuclear submarines, besides being expensive, ride around in our supermarket: they discharge in coastal waters. I was out in Hawaii. The nuclear navy goes in and out of Pearl Harbor. Also the Bumblebee fish company fishes the tuna fish from Pearl Harbor area. They bring it in and they can it in Hawaii. I actually went to the Department of Noise and Radiation of the State of Hawaii and I asked them if they tested the tuna fish. And they told me they didn't have to because none of it was sold in the state of Hawaii—it all was shipped in to the west coast. I don't know where they catch the others but I've never eaten Bumblebee since. Next.

The *money* that goes into this—this slide is outdated and I made it a year ago—it's now one and a half *million* dollars a *minute* is spent on this stuff. Next.

What the money is *not* spent on is education, health, the arts, social services, rapid transit, all kinds of things. Next.

These are expensive. You can build a lot of hospitals for this. If you also notice these blastoff rockets, they do a lot more to the atmosphere than your underarm deodorant. Next.

These kinds of polluting industries are never the target of the environmental action. We don't even *talk* about the ones that make the weapons. Next.

This is the one we talk about. This is a coal-fired power plant and it's disgusting, in our air. But the question that we never ask is What's the potential for cleanup? You can *clean up this* quite more readily than you can clean up the discharges from the nuclear plants.

Also what's *totally* forgotten in this acid rain problem is the effect of nuclear weapon testing and reprocessing plants in creating acid rain. It's a secondary effect because these beta particles act like lightning. They react with the nitrogen and the water in the air and they produce nitrates and nitric acid. Next.

The rocket program—especially what they call the orbit maneuvering system—has been dumping carbon dioxide and carbon monoxide *right in* the ozone layer. We never *hear* about *that*. We never hear about what the military is doing.

Since 1985 they've been doing deliberate experiments on the ionosphere. They've depleted the ionosphere *deliberately* over *millions* of square miles, and depleted it up to sixty percent.

They also did experiments in 1984 and 1985 over Tazmania which is south of Australia. They did these over Hobart and they were supposedly creating a hole in the ionosphere so that the telescopes at Hobart would be able to see the stars without any ionosphere in the way. This was a secret military shuttle experiment over Australia in 1985. It was the summer of 198*6* that they announced the hole in the ozone layer.

Now if you're going to dump carbon dioxide and carbon monoxide in the ionosphere which is *above* the stratosphere, that's heavy—it falls—and it falls into the upper stratosphere which is where the ozone layer is. All of the information is not out yet. We're trying to get it because a lot of it is classified. But there's certainly enough to know that this business of the ozone layer is certainly *not* a reason to switch to nuclear power. Next.

This is a reminder of *who's* in the Antarctic. Next.

Much of what I've been showing is documentation of a very extraordinary societal addiction. It's an addiction which is self-destructive, it's *wildly* excessive and it's eating up the resources, both the brain drain and the money drain, and it's also created a situation where the *victims* are afraid to confront the people that are carrying out this addiction. And we all seem to be caught in it. We're caught in it in one way or another either as passive cooperators or as addicted. But we're working together to produce a society of death instead of a society of life and we don't *have* to do that, we can change. Next.

The things that *aren't* being done are on the right. And the things that *are* being done and that are taking place *mostly* in secret all around us are on the left. Next.

This is a graph that was prepared by the unions because when they got a military contract they knew that the numbers of jobs went down. It was not a help and what they discovered, or the way they went at it was to say If you had a billion dollars, how many jobs could you create? And they found that in the military you could only create 70,000 while in mass-transit the same billion dollars would have brought 90,000, in construction you could have had 105,000 jobs, daycare 120,000, medical care 140,000, education 180,000.

The question is *not* Do you want jobs? but What kind of jobs do you want? You get the *least* number of jobs for your money in the military and you get the *least* payback into society because *none* of the things are usable—I hope. So there's little or no return unless you want to *further* starve the developing world by trying to sell your weapons to them. But *certainly* they're not a market for the nuclear. Next.

The future is going to lie with the children, not with the bombs. Next.

You can live a *relatively* long time without food, but not without water, and not without air. Next.

This land is precious and we are witnessing the junking of America. Next.

Next.

These are *irreplaceable*. Next

It's *beautiful* earth. It's a beautiful *recycling* earth and we're putting garbage into it and I mean *toxic, hazardous* waste. We might *think* we're getting away with it but eventually it will come back. It will come back in the food, it will come back in the fish, it will come back and be a part of our bodies. It will be certainly coming back for our children, our grandchildren, our great-grandchildren. Or as the native people say, What will it do to my great-grandchildren's great-grandchildren? They take responsibility for *six* generations and we seem to be only looking at *one*. Next.

They're *waiting* for our answers. Next.

Next.

Next.

We *do* have ways. One is the United Nations. But we have to put some support behind it and we have to find out about it. The U.S. is doing everything possible to destroy the U.N. right now. Next.

This is the World Court. And when the U.S. joined the world court in 1945, in 1946 they added a clause and they said they will only be subject to the World Court in matters that are *not internal* affairs of the United States and if there's a dispute over whether or not it's an *internal affair of the United States* the United States will decide. There is no court that can operate under *those* kinds of terms. When the Iran hostage crisis occurred, and the United States tried to take

Iran to the World Court, Iran used the U.S. amendment and they said It's an *internal* affair and therefore the court has no jurisdiction.

So it *comes home to roost*. If we're going to *share* this planet, we have to *share* this planet. If we're going to be the bully, or the tough guy on the block and have it all our own way because we have the biggest bombs, then we can expect to destroy ourselves. Next.

Next.

I hope when the end comes for all of us it will be good and we can say We're leaving an *intact* world for the next generation. Thank you.

Questions and Responses

Q: Why was Wisconsin chosen as the example?

RB: The reason I chose Wisconsin was not because it was a bad state but because they had the *best* records, public health records. In Wisconsin *all* of the public health records are on computer, and every year the records are published in a book. In order to do the study *I* did you not only need to get the infant mortality rate but you have to know what the *birth* weight of the infant was. Wisconsin is one of just a handful of states where they have linked records. A death certificate does not contain birth weight. So you have to have computerized records and you have to have record linkage and you have to have a state that publishes the records before you can even *ask* this question.

Most of the states in the United States do *not* keep good health records. In *most* of them you couldn't even *ask* sensible questions. You pay all you money for vital statistics and they don't answer your questions and you can't get the information.

I must say too though, to my regret, after this study was published, the state of Wisconsin stopped publishing separate death rates for the low birth weight infants. Their excuse was they didn't have enough money to continue to do it. So they now don't publish it anymore. That's another way to make the problems go away. You don't look at them and you don't publish them.

Q: To what degree can toxic nuclear contaminated sites be cleaned up?

RB: That's a good question and I think that's one that is being asked generally, like What kind of a cleanup can you demand? We're facing that now with the Rongelap people. They want to go back to their homeland and it's still severely contaminated. It's very hard to tell people they can't go back. And *how* do you clean it up and what do you do?

I think it was 20/20 showed the Bikini people: they've been given the option of taking off I think it's the first four feet of soil on the whole atoll. Now that means uprooting every tree, every bush, everything on the atoll. When they take it off where do you put it? What do you do with it? Probably dump it out in the ocean which is then going to contaminate the food chain, the bottom eaters and the big turtles that go on the sea bed.

But the King, one of the elders of the Bikini tribe, said that he wanted *that* kind of cleanup. Even though it meant starting from scratch, beginning new palm trees, but he said There's nothing else that's fair to our children.

We have done incredible damage and we can't wipe it away tomorrow. It's going to be a *big* job and a *long* job. I think that *our* generation is going to have to carry the brunt of it because we're the cause of it. I don't think *delaying* it is going to help. And I *don't* think we can clean it up totally. But I think we can *certainly reduce* the level of destruction.

I'd like to say one more thing to that. I think it's a very important question. As a medical person I pose to myself, What would you do with a young person who comes in and has been on drugs? You *can't take away* the damage that person has done to himself or herself. But you can *maximize* the health that's left and you can try to help the body to compensate. The *worst* thing you can do is give up on the person and say, Well you're hopeless, go out and do what you want. I don't think *anybody* would say that so we can't say that to the earth. But we do have to maximize what health is left and we do have to be realistic.

Q: This one says, The government says that we need to have nuclear power or else the U.S. will be at a loss for energy because of our massive consumption of power. What feasible replacement could be used instead?

RB: I would sure love to know how much power the military is using. I'd like *all* of it. *All* of it, including the *massive* amounts of fuel used for these planes. I remember when we had the campaign against the B-1 bomber: finding out that *one* B-1 bomber used in *one* year as much fuel as would be comparable to running the mass transit systems in the ten largest cities in the United States. There's something wrong with our energy system when it's not the *people* who are using the energy. I see more energy use in *Europe* and they're supposed to have *lower* per capita energy than the United States.

That's my first thing—I'd get rid of that. Then I think the question has to be examined, Whether or not *all* energy has to come from electricity? What we've been *told* is we have to have electricity. You could actually pick up *seventy percent* of your space and water conditioning immediately with solar. There's no reason to say you have to go solar, solar electric and then space heating or air conditioning. They have wonderful direct solar air conditioning in Australia in Darwin. Every house has it. So we have *lots* of things we can do, the problems are in our head.

Q: There's a question here about the Rand Corporation, that I mentioned it in my book, and How would you describe the Rand role in the nuclear arms race?

RB: The Rand Corporation *fuels* the arms race. They *motivate* the military to purchase new equipment. They are a *think* tank. And they sit down and they decide that the army for instance needs something. And then they decide how *vulnerable* they are. And they tell the generals how *vulnerable* they are that they *need* this new system that somebody's thought up that will prevent a window of *vulnerability*. And of course the military likes new things and once you buy something for the army you have to buy something for the navy and then you have to buy something for the air corps. Because they compete with one another.

So the Rand Corporation *plans* the war fighting. They run the so-called war "games." They operate under *worst-possible* circumstances. They assume the worst will happen and then they try to keep everybody running. It's really an arms "chase." It's not an arms race. And they fuel it. They fuel it deliberatively and manipulatively.

Q: This is a loaded question: Is there a link between the Nevada tests and the California earthquakes, or a link between radiation and AIDS?

RB: The Nevada tests—*most* of the Nevada tests register about five on a Richter scale. So they *are* earthquakes. The *seismic* difference between a test, a nuclear underground test, and an ordinary earthquake is noted *not* in the original blast, which by the way can knock a worker of a ladder in Las Vegas—they send out warnings when they are going to set off the blast so there aren't outside workers up high and killed—but the way you tell the difference between a nuclear blast and an ordinary earthquake is in the aftershock. So in an ordinary earthquake if you had let's say six on a Richter scale the aftershock would probably be about a five. It goes down one order of magnitude. Whereas at the Nevada test site if you had a six on the Richter scale for the blast the aftershock would be about a four. It goes down two orders of magnitude. That's the main difference.

The nuclear tests can certainly trigger earthquakes. I was always suspicious of the Guatemala earthquake and also of the one in Columbia that happened a few years back on Holy Thursday when the church collapsed. Do you remember that? Right after I saw that on the TV I telephoned the Nevada test site to find out what was going on. They had had a series of tests that week—one every day. So I think some of them are causing earthquakes. It would be a *major* research undertaking to find out which ones were and which one's weren't.

The relationship between radiation and AIDS is another one where we need more information. But it's very clear that radioactive material incorporated into bone and lymph tissue undermines your ability to fight infections. It's not at all coincidental, in my opinion, that the people now suffering the AIDS epidemic are also the people born between 1951 and 1963 when they did the above-ground weapon-testing in Nevada, and they did the testing in the Pacific in the atmosphere. So there *probably* is a connection to it but we don't know all the answers to it. Nor are we asking the questions.

Q: I have heard that the radioactive water left from the accident at Three Mile Island will be boiled off in order to dispose of it. What is your opinion of this—is it safe?

RB: What would you do with the water? The contaminated water that was dumped into the Susquehanna River ended up in the water supply of Lancaster in Baltimore. It goes down into the Chesapeake Bay and comes back in your nice seafood from the Chesapeake Bay.

If you put it in the ground it comes up in the next crop—it's nutrients.

Boiling it off in order to dispose of it, you will make some of it airborne, you will concentrate some of the heavier solids. Certainly anything where if you're beyond it's boiling point—something like cesium would go off with the steam. Cesium would be lost. Cesium is lost from reprocessing plants. Cesium is lost with the waste disposal method of turning everything into glass—glassification or vitrification. They heat it to a high temperature and they lose the cesium.

Either that or we put in it barrels that can be repackaged every generation. So we make the growth industry of the future toxic waste, we teach our children how to repackage the waste, and we just do it forever. Every generation puts it in new barrels. And we keep that up now for the rest of the history of the planet.

Q: How much radiation exposure will you receive for a one-week stay at the Nevada test site?

RB: I can't tell you. I really can't tell you. You never know—most of those underground blasts leak to the air. Most of them do. They frequently release the radioactive gases. The earth traps the particulates. Some of them now are being done in mines, they hire miners, and they do it *deep* into the ground. Some of those are not releasing *much* to the air—except in an accident like the Mighty Oak one.

So how much is contaminated from the past? I don't know, but there were over a hundred bombs set off in the air. So the debris from a hundred bombs is there on the desert.

Q: Critics claim that by exposing children to arms race and other nuclear issues we are needlessly frightening them and exposing them to partisan politics. How do you suggest educating and stimulating interest in nuclear issues within the public educational system without scaring the children.

RB: I don’t think it’s our *talking* about the nuclear that scares the children, I think it’s the *nuclear* that scares the children. There’s a wonderful comedian in Canada called Bob Bossun. He lives in Vancouver and he has a medicine show on How to Stop a Nuclear War. He’s marvelous. He can entertain you for two hours and you just sit there and laugh but you also learn a lot. But one of the things he says is, What shall I tell my children about nuclear war? Tell them what you’re doing to stop it. Okay, that’s what you tell them.

Q: Has there been a measurable increase in the average background radiation of the earth?

RB: That’s the $64,000 question. When I looked back to see what was *said* to be the radiation level—just in North America—it *used* to be that we got sixty millirem a year background radiation—that was the measurement. Then it went up to about a hundred. And then I heard a hundred and twenty and they’re now saying two hundred.

Now there are some reasons for it. That first number, sixty, didn’t have radon gas in it. Radon gas is generally released by uranium mining and it now bathes all of North America and it’s pocketed more in some places than others. Also our construction has dug into ore beds and we’ve released a lot of radiation.

So some of it’s due to that. But there is also a crazy jargon you have to deal with. ‘Natural background radiation’ means *anything* that is not literally *man-made*—that’s not sexist—that means men made it. "Natural" background radiation though includes things like uranium mining because they didn’t make the uranium. But they took it out of the ground, where it was not exposing people, and pulverized it and put it on top of the ground, but it’s still ‘natural background.’ So if you want to be really *precise* you call it ‘technologically enhanced natural background radiation.’

So you’ve got *this* jargon to deal with. Then besides that, *background* radiation includes fission products but they have limits. So only *fresh* fission products are usually pounded. And anything that’s been out of a nuclear bomb for more than a year or released from a nuclear plant for more than a year is called ‘background radiation.’ It’s no longer "fresh fission." So if you license one nuclear power plant, and you’ve got two on the property, the second one can be called "background" radiation while you license the first one.

So there’s all kinds of tricky legal jargon. You can’t—*I* can’t get a straight-forward answer to a very straight-forward question. You deserve an answer but I can’t give it to you.

Q: Is food irradiation a device to create a market for radioactive waste, and thereby bail out the moribund nuclear energy industry while converting a waste disposal problem into a money-making asset?

RB: Well certainly food irradiation is an unacceptable way to treat food to start with. *Why* people are doing it, I’ve heard many reasons. I think using the waste and trying to make money off of it is an old Wall Street trick—if you can sell your waste, you’re ahead.

But there are other reasons. The military has been desirous of the plutonium from the commercial fuel rods ever since they closed West Valley in 1972. There *was* on the books a law that said that the military *cannot take* fuel rods from the commercial industry. After the recent election of Bush, in the lame-duck period where Reagan was still president, he signed an Executive Order saying that the commercial nuclear industry fuel rods could be commandeered by the military in case of national emergency. And there’s no definition of "national emergency." I might not be telling you the exact words, but this is what it amounts to.

The underlying reason that some people ascribe to this push for food irradiation is that the scale of it, and the number of facilities, will demand that the commercial fuel rods be reprocessed to get the cesium-137 to run the food irradiation plants. It's on a *huge* scale. Now once you allow reprocessing of commercial fuel rods, there's no way to prevent the diversion of plutonium into the weapons industry. And as you know all of the weapons industry is shut down right now. The most critical thing is the tritium. But it's a good thing. You *should* clap.

Q: Please discuss the effect of radiation on genetic structure of DNA and its affect on diseases of aging.

RB: Those are two different things. There is such a thing as cellular genetic or cytogenetic genetic damage and that's basically what radiation does in the body. It destroys the DNA which is the protein in the nucleus of the cell that gives the cell the information on whatever it's supposed to be doing in the body. So for instance, if that cell is making a particular hormone and you change the DNA then it produces a faulty hormone that won't do what it was supposed to do.

For example in adult-onset diabetes, many people who are diabetic have a lot of insulin. If you tested them for insulin in the body they'd have a normal or even an above-normal amount but it doesn't bring down the blood sugar. So what it means is at some point in their life the insulin changed, or mutated, and while it was able to bring down the blood sugar when they were younger, after that point of mutation, or mutation of the cells producing the insulin, it's now ineffective—it's not working. So you have to have an injection of insulin to bring down the blood sugar.

The same thing happens with antibodies. A person becomes allergic to something and you say, 'Well I always could do this but suddenly I'm now allergic to it.' Then either it's a new substance in your environment and you don't have any protection for it, or else the antibody has mutated or the cells producing the antibody have mutated and you find it's not effective anymore. So you experience allergy. You could experience not being able to digest certain foods that you used to be able to. So that's the enzymes affected.

Then the other DNA damage would be to knock out the resting mechanism of the cell and then the cell reproduces—and it usually rests afterwards, and then it reproduces, and rests. But if you knock out the resting mechanism, it reproduces, reproduces, reproduces, and you get a tumor. That's what it is, it's a runaway growth. The cell doesn't have a resting state. It's just a wild growth of too many cells in one—[tape side ends here].

. . . body-breakdown process. So the more natural background radiation there is a part of it. And the most obvious thing that happens to us is we grow old. At sixty you don't really feel the same as you did at twenty, there's a difference. The biofeedback mechanisms become less trustworthy and eventually you succumb because you cannot cope with your environment and the bacterial and viral and other chronic disabilities that come, you can't cope anymore. And we die, and that's a normal cycle. But you can make the cycle go faster with more radiation exposure. So it's an acceleration of the aging process.

O.K., What can we do? is too big a question to answer at this point but I'm going to tell you the story about Moses putting his foot in the water. When he wanted to cross the Red Sea it looked pretty formidable, and as long as he stood on the bank and wished he was on the other side, nothing happened. But if you read the Bible carefully, you'll find that he had to put his foot in the water and then it parted.

So my advice is to please put your foot in the water and you'll wish you had a hundred people to help you because there's *lots* to be done out there. We're making a new way to live on this planet and we're forming a global village. If you want to be part of it, there's LOTS of work to be done. It can be done no matter what your expertize is it's needed because the global needs construction, the global village needs medical care, the global village needs social workers, it needs electricians, it needs writers, it needs dancers, it needs everything. Everything. Only think about what it would be like if you did it in the whole world and not just locally. Thank you.

For more information about all this please contact:

The International Institute of Concern For Public Health
710-264 Queens Quay West
Toronto ON M5J 1B5 Canada
Tel: +1-416-260-0575
Fax: +1-416-260-3404
E-mail: IICPH@compuserve.com

Committee for Nuclear Responsibility (Dr. John Gofman's group)
P.O. Box 421993
San Francisco, CA 94142-1993
415/776-8299

Radiation and Public Health Project (Dr. Jay Gould's group)
302 W. 86th St.
New York City, NY 10024
212/496-6787
212/362-0348 [fax]

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KOYAANISQATSI

ko.yaa.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.