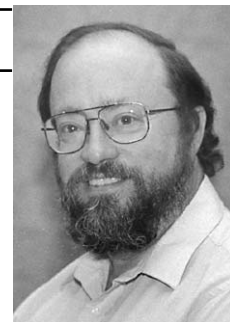

Interview: James B. Muckerheide



Radiation protection laws: It's time for a change

Mr. Muckerheide is a founder and president of Radiation, Science, & Health, Inc. (RSH), a new international group of independent radiation health effects scientists and analysts. The group has been at the center of the battle to put radiation protection standards on a more realistic and scientific basis, exposing the propaganda, myths, and lies that have surrounded this issue (and everything else nuclear). They have assembled and publicized the vast scientific literature that contradicts the simple assumptions that are now used to justify extreme regulations regarding nuclear power, along with high public costs, and escalating public fears.

Muckerheide is the Massachusetts State Nuclear Engineer and a member of the Governor's Advisory Council on Radiation Protection. He has worked with the Advisory Council and the international science community to compile some of the voluminous data on the effects of low-level radiation. His articles, "The Hazards of U.S. Policy on Low-Level Radiation," and "How the Data Were Suppressed and Misrepresented," appeared in the Fall 1997 issue of 21st Century Science & Technology magazine.

He was interviewed by Marjorie Mazel Hecht.

EIR: RSH has assembled scientific evidence demonstrating that the current, internationally accepted model for predicting radiation effects, and for setting standards for radiation protection, is wrong. You have also proven wrong the so-called linear no-threshold approach, which assumes that *any* amount of radiation causes damage, and that this damage can be calculated as a linear extrapolation from the known effects of damage from high-dose radiation. Can you discuss some of the biological evidence disproving the linear model?

Muckerheide: The so-called linear model has been justified by the biological concept that a single radiation ray or particle can damage DNA in a cell, which can later become a cancer. This is the only way the biological response can be linear and that cancer can be a "chance" event. However, molecular and cellular biology have recently disproved this concept. There are three fundamental changes, among others, in understanding the applicable biology.

In brief, the first is that even with 15,000 rays or particles per second hitting a human body from natural background radiation, this is thousands of times *less* than routine DNA

damage from normal oxidative metabolism and other stressors. Even though it is found that radiation causes a higher "double strand break" rate in DNA, this DNA damage is still trivial compared to that of normal metabolism, and the effects of heat, and exercise.

Therefore, even if natural background radiation is doubled, or increased tenfold, its effect on the body will still be very far below the rate of natural, metabolic DNA damage and repair.

The second fundamental change in our understanding of the biology, is that the process of generating a cancer is a multi-step process, with three to six steps usually described. This process includes active feedback mechanisms in managing repair, not only of the DNA, but also of the cells themselves, if the DNA is damaged. The known mechanisms, although they are not fully understood, result in a biological process that cannot be linear.

And the third fact is that radiation is shown to stimulate repair mechanisms, both at the molecular and DNA level, and mechanisms at the cellular level. Such biological stimulation effects, including lower cancer and successful cancer treatment, are wholly consistent with the evidence for beneficial effects of low-level radiation in animal studies and in humans. This is consistent with the extensive data that show also that organisms that have been exposed to *lower-than-normal* background radiation suffer physiological deficiencies in many growth and functional aspects of biological health. After all, if you have a plant that suffers in the direct summer Sun, you do not save it by putting in a closet.

EIR: You also have amassed startling epidemiological evidence from studies of populations exposed to vastly different levels of background radiation. It seems to be clear that people who live in areas where there is high background radiation have lower cancer rates.

Muckerheide: Yes, annual natural background from radioactivity in the Earth and cosmic radiation varies from a factor of 10 to 100. I was born on Martha's Vineyard, in Massachusetts. When President Clinton was vacationing there, it struck me that background radiation varied from tens of millirem, in places like Edgartown on Martha's Vineyard, to hundreds of millirem in places in Wyoming, where he had also vacationed.

Many areas of the world have even higher natural sources of radiation. Studies where significant populations can be compared have shown no adverse effects from these large differences. In fact, the data show consistently *lower* cancer rates in areas with high background radiation.

The Proceedings of the Fourth International Conference on the High Natural Radiation Areas, held in Beijing in October 1996, further document these results.

EIR: How do scientists explain this?

Muckerheide: Some scientists link the known stimulatory effects of radiation on biological functions and the immune system to the lower cancer rates. In Japan, the residents of the high-radon area of Misasa Spa have very much lower cancer rates than a similar, surrounding area, and both regions have lower cancer rates than those of Japan as a whole.

In the United States, lung cancer is much *lower* in areas with high radon levels than in areas with very low radon levels. But these results are misrepresented by the radiation protection establishment. In 1973, the U.S. government terminated work that it had initiated to assess effects of variations in background for Environmental Impact Statements, after preliminary results with coarse data showed no excess cancer, and, in fact, lower cancer rates, in the high background radiation area.

This is typical of many such studies, including the best study, which has been going on by health authorities since 1972, in China, between two large equivalent populations in Guangdong Province.

EIR: Based on the results of these studies, there is some work going on in Japan to test the benefits of low-level radiation.

Muckerheide: Yes, in Japan, in fact, the research evidence of immune system stimulation from low-level radiation has been used to successfully treat some cancers. Nasal cancers have been dissolved using X-rays to the trunk to stimulate immune response. Also, non-Hodgkins lymphoma patients treated with low-dose radiation to stimulate the immune system have a 90% survival rate after six years, compared with only 36% survival of patients (after four years) treated with normal high-dose radiation therapy alone. The patients treated with low-dose radiation were those considered hopeless. It is a tragedy that the research to confirm these results and apply this knowledge is limited by today's official radiation science policies, which assume that low-level radiation is harmful, and therefore prevent such research from being conducted and funded.

One interesting question is: When the evidence for treating and prevention of cancer is finally taken seriously, will the "story" be that the stimulatory effects of low-level radiation can successfully treat cancers, or that, for decades, the evidence has been ignored, because of control of radiation science policy by persons and organizations interested in so-called radiation protection, instead of radiation and health?

These issues have been known since the turn of the century. Yet, they have not been substantively considered, even with millions of people who have used radiation for health benefits, often without adequate scientific bases and controls.

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One comprehensive study of the evidence comparing shipyard workers who were exposed to radiation and those who were not, estimates that as many as 200,000 people per year die of cancer prematurely, compared to persons who live with higher doses from natural or occupational sources.

EIR: You recently attended an international scientific meeting on this issue that marked a breakthrough of sorts on radiation policy. Do you think this indicates that policy changes are possible?

Muckerheide: Yes, this conference of leaders of organizations that determine health effects from ionizing radiation, "Creating a Strategy for Science-Based National Policy: Addressing Conflicting Scientific Views on the Health Risks of Low-Level Ionizing Radiation," was sponsored jointly by the Council of Scientific Society Presidents and the Johnson Foundation, at the foundation's Wingspread Conference Center in Racine, Wisconsin. The conference issued the surprising statement that *there is no evidence that there are any adverse health effects from ionizing radiation below at least 10,000 millirem for exposures in a short time.*

A millirem is a unit of energy. To give you an idea of what it measures, there are about 5 millirem for a chest X-ray or a transcontinental jet flight, and annual limits of exposure can be as low as 15 millirem. At the same time, annual radiation from natural sources in the Earth and cosmic rays varies in the United States from less than 100 millirem to more than 500 millirem, and up to 10,000 millirem in residential areas in some places in the world.

The conference was a real breakthrough in considering the scientific data on radiation health effects. Now this international group is in a position to challenge the huge and unjustified public costs for radiation cleanup at nuclear sites, which are expected to exceed \$2 trillion worldwide. It will also challenge those radiation science policy and regulatory interests that fail to consider these data in continuing to set radiation dose limits that are not based on evidence, and that cost the public billions of dollars.

EIR: What led to the statement adopted at this conference?

Muckerheide: Many of the scientists involved are distressed because the scientific work of the last several decades has been ignored, and misrepresented, by those who have set the rules for radiation protection, and, in this process, fostered unjustified fears of radiation. As a result, in addition to unnecessary costs, some people have been led to refuse valuable,

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life-saving medical treatments. And in Europe, as a result of such unwarranted fears, more than 100,000 pregnant women who were exposed to trivial doses of radiation after the Chernobyl accident had abortions — out of fear that the radiation would cause birth defects. This was solely the result of misrepresentations of the risks of radiation. In addition, the radiation limits set for evacuating people from around Chernobyl were *below the average radiation in Norway*, and far below the high-background areas of Norway and other areas in the world. As one of the scientists supporting this effort asks: “Should Norway be evacuated?”

EIR: What’s the next step?

Muckerheide: This effort is only beginning to get the attention of the wider science and policy community, but will continue until a new, open evaluation of the evidence from the scientific literature, and common sense, is achieved. We are confident that we will be able to force discussion of radiation standards to be based on scientific data, instead of fear.

For example, the Environmental Protection Agency and the Nuclear Regulatory Commission are now arguing about whether annual radiation cleanup limits should be 15 millirem or 25 millirem. Obviously, both agencies are backing limits that are much less than the variation in normal background radiation, so these limits cannot possibly provide any health benefits, even if radiation were harmful at such low doses! If these levels were harmful, the people in the high-dose areas of Wyoming and Colorado would be substantially harmed, simply by living there.

If we use the EPA and NRC standards, perhaps these agencies and the Martha’s Vineyard Chamber of Commerce should have advised President Clinton not to vacation in Wyoming the last two years! Or the Department of Energy, the EPA, and NRC should recommend the evacuation of Denver, because this would reduce radiation exposure for more people at much less cost than their current cleanup programs. And perhaps they should remove the Congress and government agencies from some high-radiation-source granite buildings.

On the other hand, the U.S. Centers for Disease Control could have advised the population that health conditions in Colorado and Wyoming are better than in the low-radiation-dose areas of the southeast.

EIR: The cleanup issue isn’t a trivial matter. We’re now spending billions of dollars to make former nuclear sites su-

per-clean. . . .

Muckerheide: The United States will spend more than a trillion dollars to meet the current, official clean-up standards, yet these standards have absolutely no health protection benefits. This overreaction to normal radiation levels warrants a new assessment of the data, including data showing low-level radiation for health benefits.

Millions of people throughout the world use radiation supplements, including radon spas and treatments. The few medical studies demonstrate some beneficial effects. Workers and residents in such areas, who get much more exposure than patients who come for only a few days, show beneficial effects, including lower rates of cancer.

But research is not funded for the groups doing these studies, nor for the millions of people who receive moderate doses in medical procedures. In a thallium stress test, for instance, my dose rate was 20 millirem per hour, on my chest, which would be less than my internal dose. It was measurable for weeks. It’s certainly very much greater than 15 millirem in a year. A million healthy people get this treatment every year, and the study data show *there are no adverse effects*.

A million people a day get some form of nuclear medicine and radiology treatment. The limited studies of these patients, from nuclear medicine and radiology treatments, including much higher doses than regulatory limits, show no adverse effects (except for a few special circumstances from early high-dose treatments). But research to confirm these results has not been supported. The research programs are funded and controlled by radiation protection interests, which have no interest in radiation and health.

EIR: I think the emphasis has been on funding studies looking for adverse results of radiation from nuclear projects during and after World War II, with the idea that people were “victimized.” The pressure for such studies comes from the greens. . . .

Muckerheide: Yes, although the greens are mostly instigators for the agencies and others who benefit from the billions of dollars a year spent chasing non-existent radiation risks.

One such example of the funding of non-scientific research is the effort to find health effects from releases of iodine-131 in the “downwinder” populations from the Hanford nuclear reservation in Washington state from 1946 to 1972. Iodine-131 has an eight-day half-life. One-half of the materials decays away every eight days, so most is gone

within two months, and essentially all is gone in three months. The most significant dose is to children, because iodine-131 collects in the thyroid, and children have smaller thyroids, and ingest relatively more milk than adults do. It is assumed that released radioactive iodine falls on a pasture and is eaten by cows, which then produce the milk that is drunk by children. This is then a “thyroid dose,” not a general dose to the body.

On the other hand, since the 1950s, iodine-131 has been used extensively for thyroid diagnosis and treatment, so there are millions of people who have received high and moderate thyroid doses from medical use of iodine-131. These have not been found to cause cancer (although there is no experience in very young children).

I’m a Hanford “downwinder.” I lived in the 75,000-square-mile study area, in Moscow, Idaho, from 1946 to 1949, so I’ve kept up with the work there. It seems that, beyond the government effort to estimate doses, the effort to find health effects essentially provided \$10 million for scientists who claimed they could find results — and no funds for the qualified scientists who said it is impossible, and who then went on to other things.

The greens and other political, non-scientific groups are funded to participate and instigate public concern and support, combined with those who are interested in seeing billions of dollars spent, whether there are any public benefits or not. No one really speaks for the public.

EIR: This skewing of the research is not a new phenomenon. I think that RSH has begun to pull together the historical research on previous projects that were squelched because they didn’t fit the propaganda line that “radiation is harmful.”

Muckerheide: Radiation use in health benefit applications has been known but constrained since the 1930s, when the gruesome death of industrialist and socialite Eben Byers, by the degeneration of his bones (not from cancer), from massive overdoses of radium, enabled the Food and Drug Administration to have Congress grant it regulatory control of radiation. Initially, Mr. Byers found the use of radiation to have very stimulating effects, but the FDA never acknowledged that this sensational case was the result of an *enormous* overdose condition. Nor did it argue that he did not die of cancer. Also, the FDA never studied the effects of radiation on tens of thousands of people who had been using radium and various radiation sources for health benefits.

In the 1950s into the 1980s, substantial work was started at the Massachusetts Institute of Technology, by the world-renowned Dr. Robley Evans. He had been evaluating cases since the 1930s, in a program that became the Center for Human Radiobiology in 1970. Dr. Evans showed that the linear model used by the standard-setting organizations, the International Commission on Radiation Protection (ICRP) and the Biological Effects of Ionizing Radiation committee (BEIR) 1972, ignored the data from the MIT program.

Eventually, Dr. Evans found and studied the cases of several thousand persons who had ingested radium, mostly those who worked with luminous radium paints, and who put the brushes in their mouths before 1925. Only a few of the persons with doses far above roughly 3 million millirem had a bone cancer or a nasal cancer (from exhaling radon decay products, from the decay of radium in the bones). The thousands of persons with less than 3 million millirem had no cases of bone or nasal cancer. They also had no other adverse effects, except a slight increase in breast cancer in the radium dial painters who worked long hours at studio benches exposed to luminous radioactive compounds. And even these women are living longer than other women workers of the 1920s.

In the 1980s, after an international conference reported that there were still no adverse effects at less than 3 million millirem, this program, sponsored by the Department of Energy, was shut down, while other programs were funded which expend hundreds of millions of dollars for “research” that can produce no credible results, because of flawed premises, biased analysis, and misrepresentation of results, often simply to contribute to public fears.

In the shutdown of the Center for Human Radiobiology, scientists and program managers were reminded that funding depends on the political correctness of the answers produced. This has been true of radiation health effects “science” since the 1950s.

EIR: Certainly, today, millions of dollars are poured into environmental research that does not benefit anyone except the environmentalists doing and promoting the research.

Muckerheide: Yes, well, hundreds of millions of dollars have gone to the “research” efforts to foster public fear, with extensive outreach programs that do not consider the real data. Instead, non-scientific activists are funded, who are convinced that small amounts of radiation cause cancer, notwithstanding the evidence. But the real public costs are not for the research, and do not just benefit the researchers. The rules that are promulgated serve the purpose of large bureaucracies and the expenditure of hundreds of billions of the public wealth, while constraining the public benefits of nuclear technology.

A case in point is the several billion dollars spent every year at the Hanford nuclear reservation (and other sites) on “cleanup,” at the same time that the nuclear technology research facilities have been de-funded and shut down.

Since the 1970s, and probably earlier, it has been known that if the site were not “cleaned up,” except to stabilize the most significant waste sources, the *worst case* of possible releases to the environment would be *thousands to millions of times less radioactivity* than was released from site operations in the 1940s to 1970s, and *millions to billions of times less radioactivity* than is being “discharged” by Mother Nature to the air and the nearby Columbia River.

It’s like being concerned about the additional risk of

drowning from adding a gallon more water to a swimming pool. And being convinced to pay a contractor to remove that water—not just to remove a gallon of water, but to remove those same molecules of water. And perhaps, if you were told not to use the swimming pool while this operation was going on, indefinitely, you might wonder about the justification the contractor used to sell you this one.

EIR: What are your next steps in trying to reverse this situation?

Muckerheide: Clearly, the most significant step is to organize and distribute the credible data with the most senior scientists in the world, who do not have a conflict of interest. These data and the message of biological and epidemiological science must be recognized by the larger science and public policy communities, outside the narrow, controlled, radiation protection interests. The basis for the statement by Dr. Gunnar Walinder [a Swedish radiation expert], that “I do not hesitate to say that this is the greatest scientific scandal of the 20th century,” must be recognized and understood by the wider science community.

We must continue to introduce this evidence into legislative assessments and investigations, and into regulatory and public policy forums and in scientific and professional societies, in association with industry and non-governmental institutions that have an interest in responsible public policy. We must also formally challenge arbitrary and capricious decisions by government agencies, including the egregious misrepresentation of the data by some committed self-interested advocates.

When responsible science and industry initiatives have been developed, we can undertake legal and legislative efforts that can engage the public in discussing the role of natural radiation. This can enable clarification of the insignificance of radiation contributions, and the magnitude of the costs that some government institutions, and supporting individuals and organizations, have imposed on the public for no public benefit.

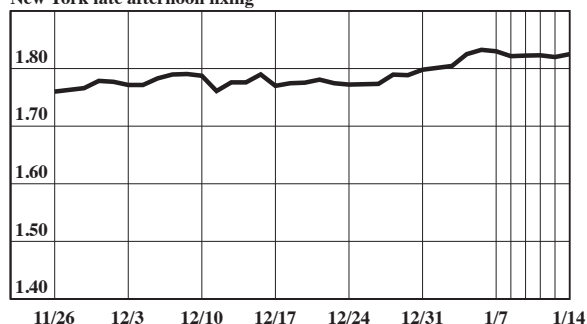
We encourage people to support the Radiation, Science, & Health efforts to obtain the support—financial, technical, and administrative—necessary to organize and present the evidence, and to participate in formal proceedings. It is appalling to realize that millions of dollars are committed to defend the linear no-threshold approach, while the most knowledgeable senior scientists in this field are not funded; their work is ignored, and they are often unable to travel to scientific meetings, except at their own expense.

Many nuclear technologies and medical applications are of enormous significance to the growing world population, and can be realized, once the highly burdensome and unjustified economic constraints are lifted. This will be an important path to preventing oil, food, and resources conflicts from overtaking the world in the early 21st century. This is for the world our children and grandchildren will inherit.

Currency Rates

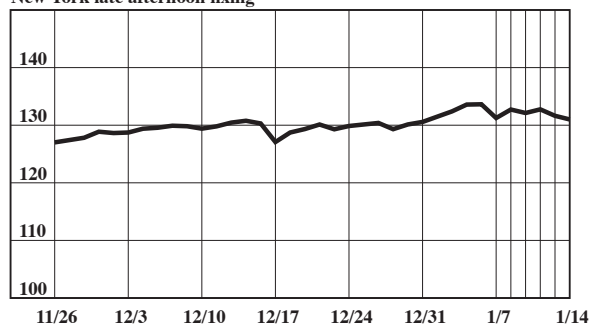
The dollar in deutschemarks

New York late afternoon fixing



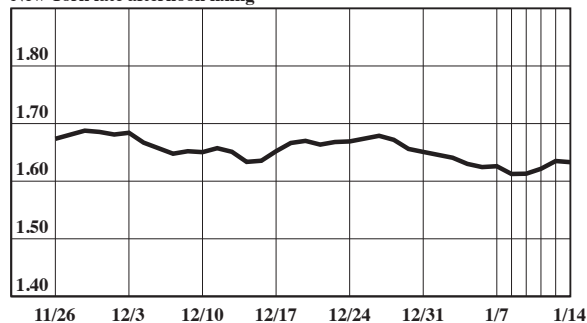
The dollar in yen

New York late afternoon fixing



The British pound in dollars

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing

