LET’S STOP REGULATING HARMLESS LEVELS OF RADIATION

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Denial is the defining characteristic of radiation protection policy, which presumes that any amount of radiation, however small, is a public hazard. There is no controversy on this point; controversy implies discussion and disagreement. No one seriously argues that scientific data or theory support the presumed harmfulness of low-dose radiation. Scientific data refuting this unsupported presumption has been repeatedly published in peer-reviewed journals and formally presented to the regulatory agencies and to their scientific advisory committees. This evidence shows that low-dose radiation is not harmful and is often beneficial. Such beneficial effects are in full accord with biological theory and experience across a wide variety of toxins and organisms. (For example, look at the array of deadly toxins in your multivitamin—lethal at high doses, but in tolerable amounts, essential to life.)

When we challenge the Linear No-Threshold (LNT) model, this is the crucial point: the harmlessness of low-dose radiation. The precise shape of the dose-response curve, or the exact point at which to declare a regulatory threshold, are secondary. First, we have to face the fact that there is ample evidence to support the conclusion that low-dose radiation is not harmful. If those who insist that low-dose radiation is harmful are correct, then, by their own calculations, the radiologists who use far larger amounts would be mass murderers—which I doubt.

Let me briefly summarize this large body of scientific evidence. First, there is a great deal of theoretical and laboratory data at every level—molecular, cellular, in mice, rats and dogs, and clinical data with humans. In addition, there are 13 million person-years of field data from the world at large, including workers routinely exposed to low doses of radiation at their jobs and military participants in A-bomb tests. The weighted-average cancer mortality of these people is 66% of the “normal,” based on data from carefully-matched unirradiated controls. Prof. T.D. Luckey, formerly Chair, Biochemistry, University of Missouri-Columbia School of Medicine, concludes¹ from these figures that if the entire U.S. population were given supplemental radiation doses, as we now recommend supplemental doses of other essential nutrients, we could prevent over one million premature cancer deaths in a decade—about one-third of all cancer deaths! He may not be precisely correct, but his figures have not been formally refuted, and they are consistent with several thousand credible scientific papers in the scientific literature.

In fact, some medical researchers and clinicians, particularly in Japan, have used this principle to successfully treat cancer. By giving half-body or whole-body irradiation with high-energy x-rays, 10 to 15 centiGray (or rad) per exposure in about one-minute, two or three times a
week for five weeks, for a total of about 150 cGy, sometimes with surgery and high-dose local irradiation, the immune system shows increased activity and the body’s defenses go after the cancer, without the debilitating effects of chemotherapy. Despite the successes in Japan, and a replication at Harvard Medical School in 1976, the medical establishment has been unwilling to defy current radiation protection philosophy to use this treatment.

Recently however, there has been a break-through. Dr. James Welsh at Johns Hopkins has just completed this treatment with an 81-year old retired American naval officer, and preliminary results are encouraging. In vivid contrast to chemotherapy, the patient said he “never felt better,” and is continuing a very active life. More lymphoma patients are being considered for such treatment.

The extensive scientific evidence of the benefits of stimulating the immune system, and stimulation of other beneficial biological effects by low-dose radiation has never been questioned by the regulators and their committees; it has just been brushed aside with generic statements that “we don’t really know” and “epidemiological data [that is, data about real people living their normal lives] can never give us the answer.” But it can, and it has. Natural radiation levels of various populated regions of the earth vary one-hundredfold. In some high-level areas, the “predicted” cancer mortality from radiation exceeds the total number of actual cancer deaths from all causes! Detailed studies of cancer rates, longevity, genetic irregularities and other health indicators among large populations exposed to greatly different natural radiation backgrounds support all the other evidence that low-dose radiation (up to at least one hundred times our average background radiation, and many thousands of times greater than the microsievert levels being regulated) is not harmful, and may be beneficial.

Against this solid evidence we have only vague, general objections and a few weak studies. In the few instances where the arguments start to become specific, we find they are based on incorrect or misleading interpretations of the data; for example, trying to explain away the beneficial effects of radiation clearly shown in the massive Nuclear Shipyard Study, by attributing it to “the healthy worker effect,” whereas the study was carefully designed to eliminate that artifact by matching up irradiated welders, pipe-fitters and machinists with unirradiated workers in the same trade at the same shipyard. In other cases, there was selection and manipulation of data that completely reversed the indications of the data. Even the informal report released by DOE in 1991 did not report the fact that “all-cancer” mortality was significantly reduced in the radiation workers. In still other cases, work that contradicts the LNT premise has been summarily defunded and the research not reported or considered. Radiation, Science & Health, Inc. is proposing that appropriate action be undertaken to challenge these situations.

In response to increasing demands, various ‘official’ national and international committees and conferences, such as the BEIR-VI & VII and the NCRP SC-1 committees, and the 1997 IAEA Seville Conference and Wingspread Conference, and the recent Airlie Conference, have been set up to examine the basis for presuming that low-dose radiation is harmful. But these have all studiously avoided including those respected researchers who have produced the refutory evidence.

These advisory and policy-making groups have been challenged by anti-nuclear groups as being biased in favor of nuclear power. That challenge has some basis, in that the participants represent the radiation-protection community rather than the larger medical and biological community, but that is a minor point. If the refutory scientific evidence were truly to be
examined objectively and openly, it wouldn’t matter what political views were held. The real conflict of interest is not between pro-nuclear and anti-nuclear, but between those whose reputations and incomes derive from maintaining the position that low-dose radiation is hazardous and little-understood, and those who have no such conflict but have been excluded.

Unfortunately, the institutions that have much to gain from resolving this matter—the owners and operators of nuclear facilities and associated organizations—are themselves the benefactors of research grants and massive studies and decontamination projects that would be largely unnecessary if the regulations and standards were brought into line with the data. The question is: how many more golden eggs can this magical goose lay before it is slaughtered by disgusted taxpayers?

The consequences of this denial are widespread and devastating. First, as the foolishness and wastefulness of our current policy and practices become more and more widely realized, public disillusionment and mistrust of government and of science grow alarmingly. This is not easily measured until it is too late the fix by a mere change of course. But it is not a problem to dismiss lightly.

Second, the cost in dollars alone is overwhelming. *Time* magazine concluded a report on radiation standards with the statement, “Where the line gets drawn between safe and unsafe radiation exposure could cost, or save, tens of billions of dollars.” Fifteen billion dollars have already been spent to dig a hole in the Nevada desert to store some sealed drums of radioactive waste. Under current radiation policy these drums are deemed an unprecedented hazard, and people are quick to point out that this waste will remain active for thousands of years. In fact, the elaborate scenario-spinning tells us that the danger will peak 660,000 years in the future, when a few exceptional atoms will struggle through miles of desert soil to contaminate the well of an innocent child. Meanwhile, we easily dispose of non-radioactive poisons whose toxicity never lessens—selenium, chromium, arsenic, vanadium, molybdenum, boron—such as the minerals you’ll find in your multivitamins. Selenium, for example, is nearly as toxic, spoonful for spoonful, as radioactive waste. I shudder to think how it would be handled if it were to come under the aegis of the nuclear regulations.

But dollars do not tell the whole story. The cumbersome and unsatisfactory regulations for handling, accounting for, protecting and disposing of tiny quantities of radioactivity have caused a number of hospitals to close down their nuclear medicine facilities and deny these life-saving procedures to their patients. People are refusing to get mammograms and other critical diagnostic and therapeutic procedures because they believe what they have been told: that there is no safe amount of radiation. For the same reason, many people refuse to buy the most effective smoke detectors, which have a tiny radiation source. Nine thousand people die each year, just in the U.S., from pathogens in food that could easily be killed by radiation. And, to supply the energy urgently needed by a developing and growing world population, anything and everything except nuclear power is being considered.

This is a high price to pay, just to get a few more research grants, and contracts to haul millions of tons of dirt across the country because it is radioactive—even though less radioactive than my sister’s front yard in Denver. We cannot expect the public, the regulators, the media, or the Congress to change this situation until we, the nuclear professionals, face up to, and announce publicly, that our policy has been based on a premise that is flatly contradicted by the scientific evidence, and we are going to change it accordingly. Perhaps cancer patients, unwilling to submit to the rigors of chemotherapy, will be the first to demand the therapeutic
benefits of the stimulatory effects of low-dose radiation, as millions of visitors to ‘health spas’ and radon mines do, and have done for hundreds of years, while the regulatory interests ignore their evidence.

Meanwhile, as for those policy-makers and advisors who refuse to look at the data, we should start calling them Cleopatra and Rameses, after those ancient autocratic rule-makers, because they are indeed the Queens and Kings of Denial.

**WHAT CAN YOU DO?** Everyone involved with radiation has a stake in resolving this situation. Yet everyone seems to feel powerless to change it. In such a dilemma, the only course is for each person to take steps to move his or her own organization toward the desired goal. We cannot wait for someone else to fix the problem. Once you make that decision, the details become clearer. For example:

1. Don’t take *my* word—assess the situation; Radiation, Science & Health, Inc. can help
   - Assign a trusted independent senior staff person to critically examine the data
   - Involve and educate your key people
   - Involve ‘sister’ organizations - establish a “working group”

2. Identify business areas potentially affected by revised regulations
   - Determine specifically how revised regulations could *save* you money
     In design, operations, planning
   - Determine specifically how revised regulations could *make* you money
     In improved performance and competitive nuclear technologies

3. Evaluate the best approaches to challenge current radiation policy
   - Identify, participate in, opportunities to initiate federal and state rule-makings
   - Identify possible court challenges to capricious (bad science) agency decisions
   - Identify possible challenges to “scientific misconduct” that adversely affects policy

4. Inform and enlist key congressional and agency personnel
   - Identify potential allies – technical, policy, and legal
   - Identify formal authorities accountable for specific science and regulatory actions

**Speak up and take action; it’s important to you and to humanity**

**REFERENCES**

