

Rachel's Environment & Health News

#185 - Radiation -- Part 3: Human Harm From Low-level Exposure

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The federal government is proposing to allow large quantities of "low level" radioactive wastes to be declared non-radioactive ("below regulatory concern," or BRC, is their phrase for it; see RHWN #183). These radioactive wastes would then be handled like ordinary household trash; they would be transported, landfilled, incinerated, reused (for example, radioactive tools) or recycled (for example, radioactive metals) along with everything else we discard each day. Such a change would expose Americans randomly to more ionizing radiation than they are exposed to today. Government and industry both argue that this is acceptable. Industry uses one justification, government uses another. Many people in the nuclear industry argue that small increases in ionizing radiation aren't dangerous at all. They argue that there is a threshold dose of radiation, below which no effects occur, and above which people may be harmed (see RHWN #184). They say the BRC program will not expose anyone to a dose of radiation greater than the threshold dose, and therefore the BRC program will cause no harm.

Government approaches the matter differently. The U.S. Environmental Protection Agency (EPA) argues that any amount of radiation causes some damage to a large population of exposed individuals; they subscribe to the "linear theory" of radiation damage (see RHWN #184). They have set limits for radiation exposure based on the moral premise that it is acceptable to kill one citizen out of every 100,000 citizens by exposing them to radiation. Since the BRC program will not cause exposures that would kill more than one in every 100,000 citizens (and the linear theory tells them that, in reality, the program will kill many fewer people than one in every 100,000), the government argues that the BRC program is acceptable because it will save billions of dollars for the nuclear power industry (which must soon dismantle its aging nuclear reactors and put them "away" somewhere) and for the government itself (which must eventually clean up millions of pounds of radioactive contamination lying around near weapons factories).

Unfortunately, there is now very substantial evidence, from studies of human beings exposed to radiation, that both industry and the government have misunderstood (intentionally or not) the dangers of low levels of ionizing radiation. (By "low levels" we mean within the range 0 to 5 rem [centi-Sievert].)

The most compelling evidence comes from studies of 91,231 people who survived the atomic bombings of Hiroshima and Nagasaki in Japan in 1945. Contrary to popular belief, most of these survivors received only very low exposures to ionizing radiation. Their health has been continuously monitored by international scientific organizations, so they represent the best available information on the effects of low levels of ionizing radiation on humans. The bomb survivor data now shows without doubt that there is no safe dose of radiation and, furthermore, that the lowest doses have caused the greatest cancer increases per unit of radiation. (In other words, the shape of the dose-response curve is supra-linear; see RHWN #184.) This means that both the industry assumption (threshold theory) and the EPA's assumption (linear theory) seriously underestimate the dangers from exposure to low levels of ionizing radiation. Furthermore, the Japanese data reveal another important fact about low-level radiation: young humans (children and infants) are more sensitive to the effects of low levels of ionizing radiation than are older humans. We will discuss the Japanese data in detail at another time.

Here we will discuss more recent human data provided by accidents that released large amounts of ionizing radiation at Chernobyl (Soviet Union, 1986), Three-Mile Island (Pennsylvania, U.S.A., 1979), and Savannah River (Georgia, U.S.A., 1970). These accidents are the subject of a shocking new book: Jay Gould and Ben Goldman, DEADLY DECEIT, cited in our last paragraph. Page numbers inside parentheses in our text refer to this book. Like the Japanese bomb survivor data, these three accidents indicate that the lowest doses of ionizing radiation cause the greatest human damage per unit of radiation. This provides confirmation that the

government's estimate of the hazards of low-level radiation is low; that is to say, today's allowable limits for human exposure to ionizing radiation will allow more deaths than our government officially admits. How many more is the question. Bomb survivor data indicate 30 times more, but even this may be low, according to Gould and Goldman.

The three accidental releases of large quantities of radiation also confirm what the bomb survivor data are showing: that infants and children are the most sensitive to damage from low levels of ionizing radiation. Consider these facts:

The Chernobyl nuclear power plant blew up on April 26, 1986; nine days later, radioactivity monitoring stations in Washington state (9,000 miles from Chernobyl) detected radioactivity in rainfall. By May 16th, 50 EPA monitoring stations detected radioactive iodine-131 in cow's milk all across the U.S. Our government said "no problem." Now government data, analyzed by Gould and Goldman, show that in May, 1986, there was a 5.3% increase in the U.S. death rate, compared to the previous year; the chances are less than one in a thousand that this increase occurred by chance. During June, 1986, the infant mortality rate in the U.S. was 12.3% higher than it had been in June, 1985, and in some parts of the country it was much higher; for example, in the south Atlantic states, the infant mortality rate in June, 1986, was 28% higher than it had been the previous year. Based on this, and on much additional evidence that we haven't space to review, Gould and Goldman suggest that current EPA limits on exposures to low level radiation may need to be tightened by as much as a factor of 1000 (pg. 21).

In November and again in December, 1970, two nuclear rod meltdowns occurred at the Savannah River nuclear weapons plant in Georgia. The plant was operated for the government by DuPont, who never told the public anything about these accidents until Senator John Glenn grilled Dupont officials in public hearings in late 1988. To this day, DuPont claims that no radiation escaped outside the plant, but official government measurements of radioactivity in rain throughout the southeastern U.S. reveal highly suspicious increases immediately after the accidents. In South Carolina in December, 1970, rain carried six times as much radioactivity as it had carried in December, 1969. Radioactivity was also measurable in local fish; fish in the Savannah river contained radiation levels 100,000 times higher than fish sold in New York City in 1971. A child who ate 1/4 pound of catfish from the Savannah River in 1971 would have received a radiation dose equivalent to 20 chest xrays. Infant mortality in South Carolina in January, 1971, was 24% higher than it had been a year earlier; in contrast, infant mortality declined that month over the entire U.S. and over the southeastern states taken as a whole. During the following summer (May through September) infant mortality in South Carolina was 15% higher than it had been the previous year. Again, we are omitting a wealth of detail.

March 28, 1979, a meltdown at the Three Mile Island (TMI) nuclear power plant spewed more than 10 million Curies of radioactivity into the environment, most of it into the air. Because the radiation dispersed quickly, most people received only low levels of exposure. Government and industry spokespeople have repeatedly assured the public that no one was harmed. However, the government's own health data tell quite a different story. Comparing the period three months prior to the accident against the period four months after the accident, Pennsylvania's infant mortality rate increased 16% and the state of Maryland's increased 41%. All together, Gould and Goldman calculate that perhaps as many as 50,000 deaths occurred during 1980-1982 as a result of the TMI accident (pg. 63).

This is an important book. Any individual fact in the book may be disputed, but the cumulative weight of the evidence is persuasive. And though we generally do not give much credence to conspiracy theories, if you read this book from cover to cover, you will have difficulty believing that your government is telling the full truth

about the effects of low-level radiation. We suggest that you act prudently to protect yourself and your family: do whatever it takes to keep BRC wastes out of your community.

Get: Jay M. Gould and Benjamin A. Goldman, DEADLY DECEIT; LOW-LEVEL RADIATION, HIGH-LEVEL COVER-UP (New York: Four Walls Eight Windows Press [P.O. Box 548, Village Station, New York, NY 10014], 1990). \$19.95

And: Keep in touch with Nuclear Information Resource Service (NIRS), 1616 P Street, NW, Washington, DC 20036; (202) 328-0002, and the Radioactive Waste Campaign, 625 Broadway, 2nd floor, New York, NY 10012; (212) 473-7390.

--Peter Montague

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Descriptor terms: brc; radioactive waste; llw; book reviews; deadly deceit; tmi; aiken, ga; dupont; jay gould; ben goldman; radiation; health effects; hiroshima; nagasaki; nuclear weapons; chernobyl; meltdown; pa; ma; groundwater;