

NUCLEAR HAZARDS: MYTHS AND REALITIES

Since about 1960, public fears in the U.S. about nuclear radiation, nuclear power, and nuclear waste have brought nuclear development to a standstill. In the 1950s, nuclear power plants were being rapidly constructed, many more were on drawing boards, and confident predictions abounded of low cost electric power being available to all within a few decades.

None of these optimistic predictions came true. Instead, electric power now costs over ten times what it did in the 1950s, and **almost no new nuclear power plants have been licensed for construction in the last several decades.**

Instead of national energy independence, we are as dependent as ever on foreign sources of oil -- a dependence which continues to generate worries, concerns and fears about the energy future of the U.S. and its reliance on Middle East oil, used in part for electric energy generation.

Ironically, none of this had to happen. While nuclear development stagnated in the U.S., in France nuclear power plants were built sufficient to provide a sizable fraction of that country's electrical energy needs. At the same time nuclear development met with public opposition in the U.S., regulators made it difficult for most power plants to burn coal, the most abundant fossil fuel in America. **At the very time America should have been moving away from a dependence on foreign oil, we were becoming increasingly dependent on it.** What is most ironic about these developments is that -

NUCLEAR POWER HAS A GOOD SAFETY RECORD

"By now there is sufficient experience -- several decades' operation in several countries -- to prove that nuclear power plants can generate energy at costs that are of the same order as, or lower than, the present costs with fossil fuels. ... When evaluating the safety of nuclear power, it is critical to keep in mind the risks to life and limb that arise in producing energy from other sources -- such as drilling accidents at oil wells, mine disasters, and the pulmonary diseases of coal miners.

"All would agree that nuclear power's past record has been remarkably good compared with the best alternatives, along with its economic advantages. The extraordinary safety record in nuclear submarines over several decades -- no evidence of any damage to human life from radiation despite the very close proximity of Navy personnel to the nuclear power plants -- is compelling evidence that nuclear power can be remarkably safe."¹ **Further, nuclear power plants expose the public to less radiation than natural sources.** Even

LIVING NEXT DOOR TO A NUCLEAR REACTOR

exposes a person to less radiation than other activities normally assumed to be safe. So, "What about living *right next door* to a nuclear reactor? Federal law requires that radiation from nuclear power plants not exceed five millirems *per year*; most nuclear facilities do better than the law requires, emitting less than 1 millirem per year. ... This legal limit amounts to just 1.4 percent of the 350 millirems of natural background radiation to which the average American is exposed each year. ... A single coast-to-coast airplane flight subjects its passengers to five

millirems of radiation in a single day, an amount equal to a full year's exposure caused by living next door to a nuclear reactor."² **There is a myth that no level of radiation is safe,** but if this were true, we would all be sick or dead, because -

THERE ARE UNSTOPPABLE SOURCES OF NATURAL "BACKGROUND" RADIATION

"Natural radiation also includes cosmic rays, which are a mixture of high energy photons and particles, mainly protons and electrons, with a smaller number of helium nuclei and metallic nuclei. Cosmic rays originate both in space and in the [s]un. ... **With all this radiation bombarding us from every direction, why aren't we, all of us, stricken with cancer?** The reason is that, although exposure to very high levels of radiation can result in the type of visible damage that leads to growth of a cancer, the situation is by no means clear with respect to low level exposures, even when they are chronic. The risk appears to be very small, indeed, and evidence is accumulating that low levels of radiation may be either harmless or a positive benefit!"³ Besides sources of background radiation outside the body, there is -

RADIATION ORIGINATING IN THE HUMAN BODY

"Every person on [e]arth is exposed to *natural* radiation coming from the ground, from space, and even from the food we eat. Trace elements that naturally exist inside our own bodies produce small amounts of radiation. **Compared to all this background radiation, exposure to man-made radiation is very slight.**"⁴

"This radiation we are exposed to from natural sources is hundreds of times larger than the well-publicized radiation we may someday receive from the nuclear power industry."⁵ The irony is that although people fear radiation from nuclear power plants, there is total acceptance of radiation in medical applications, when in fact -

EXPOSURE TO MEDICAL RADIATION DWARFS THAT FROM NUCLEAR POWER PLANTS

"The principle single contribution to our radiation exposure is natural background radiation, which accounts for over half the total. The next largest source of radiation is *medical procedures*, which contribute 42 percent. The manufacture and testing of nuclear weapons accounts for 3.5 percent; mining and burning coal, 3 percent; and the entire nuclear power process, including mining, fuel preparation, and waste disposal, contributes less than 1 percent of the total radiation present in our current environment."⁶ As an added evidence that harmless background radiation levels can vary over a wide range, consider that -

MANY PEOPLE LIVE IN HIGH-RADIATION AREAS WITH NO ILL EFFECTS

For example, "Epidemiological studies of persons living in Colorado, Wyoming, and New Mexico, where background radiation levels are as much as twice the national average, have found that cancer rates there are significantly *lower* than the national average."⁷ Aside from unfounded fears about the

radiation from nuclear power plants, there is the belief that they can explode or "blow up." But the truth is that -

NUCLEAR POWER PLANTS CANNOT EXPLODE

"Nuclear power plants *cannot* explode like nuclear bombs. As Bolch and Lyons explain, 'A nuclear bomb requires a very high percentage of uranium 235, far higher than the maximum of 3 percent found in a nuclear power plant. In addition, a bomb must be triggered by a special explosive device not found in a nuclear power plant.'⁸ Even the accidents at Three Mile Island and Chernobyl were not nuclear explosions. Anti-nuclear activists used these accidents to convince the public to continue opposing nuclear energy. However -

AT THREE MILE ISLAND, NO ONE WAS INJURED

"The accident at Three Mile Island in 1979 gave many people the impression that nuclear power is more dangerous than previously thought. [But despite] almost every possible error being made, no one suffered any harm. And the Chernobyl accident throws no light on safety in the United States because the reactor design was so different from plants in the West, and the protections provided in the West are not provided there."⁹ **Even Chernobyl was not a "nuclear meltdown."** Indeed -

AT CHERNOBYL, ONLY ORDINARY GRAPHITE (CARBON) BURNED

"While the accident at Three Mile Island demonstrated the safety of American nuclear power plants, an accident seven years later in the ... Soviet Union [at Chernobyl] demonstrated what can happen when certain safety features are missing. Nuclear power plants in the Soviet Union typically do not have containment shells, and nuclear reactions are moderated with graphite rods instead of water. On May 26, 1986, at a nuclear power plant near Chernobyl ... the graphite rods melted and steam produced by the core's rising temperature blew apart the reactor pile and the surrounding building.

"The accident at Chernobyl resulted in 31 immediate fatalities and later deaths numbering in the hundreds from fire and radiation exposure. ... But the fundamental differences between the U.S. and the ... Soviet Union, both in technology and government policy, cannot be assumed away. ... The accident at Three Mile Island ... demonstrated the inherent safety of nuclear power plants in the U.S. The lesson for environmentalists from these two accidents is that the safety precautions taken in the U.S. should be put to use in other countries, *not* that nuclear power is unsafe here at home."¹⁰

Since it has been demonstrated over the years that nuclear power plants are safe, anti-nuclear activism has focused more on the supposed hazards of nuclear waste as a way to scare the public away from accepting nuclear power. **The fact is that there is not truly a "nuclear waste problem" except in the minds of activists.** If the waste is processed properly,

NUCLEAR WASTE VOLUME IS INCREDIBLY SMALL

"The ease and safety of its waste disposal is one of nuclear power's great advantages. Nuclear wastes are 3.5 million times

smaller in volume than fossil wastes producing the same electric energy. High-level wastes which contain 99% of the radioactivity, but only 1% of the volume, are the first type of industrial waste in history that can be completely removed from the biosphere. **Their volume per person per year equals that of 1-2 aspirin tablets.**"¹¹

Part of the so-called "nuclear waste problem" has arisen because regulators have made it impossible to process the waste to condense it and make it easily storable. Even more, arguments about the unproved hazards of nuclear waste fail to take into account that -

THERE IS A PROVEN DEATH TOLL FROM CONVENTIONAL FOSSIL FUEL USE

"An 'official' report from the American Medical Association gives nuclear power an excellent bill of health, saying it is 'acceptably safe.'¹² Coal-supplied energy is assessed to cause eighteen times more deaths per unit of electricity than nuclear power, because of both mining and transportation deaths. And solar energy is 'less safe'¹³ than nuclear power due to construction and maintenance costs."¹⁴

Conclusions. Fears about nuclear power and waste are largely groundless. At the same time America has been made to fear nuclear power, regulations have made it illegal to burn coal in most power plants, or to effectively process nuclear waste. Thus our dependence on Middle East oil continues. If this is not a recipe for continued tensions in the Middle East, what is? Instead of shrinking back in fear from using the resources God has given us, our culture needs to realize that God made all the earth to be inhabited (Isa. 45:18).

Notes. Bolding in quotations is added.

1 Julian Simon, *The Ultimate Resource 2*, Princeton, 1996, p. 203.

2 J.L. Bast et al., *Eco-Sanity: A Common-Sense Guide to Environmentalism*, Madison Books, 1994, p. 104.

3 Dixy Lee Ray and Lou Guzzo, *Trashing the Planet*, HarperCollins, 1992, pp. 97-98. 4 Bast, op. cit., p. 103.

5 Julian L. Simon and Herman Kahn, eds., *The Resourceful Earth*, Basil Blackwell, p. 547; in Bast, op. cit., p. 103.

6 E. Whelan, *Toxic Terror*, Jameson Books, p. 233; in Bast, op. cit., p. 103.

7 Regarding cancer cases in western states, see C.M. Fleck, H. Oberhammer and W. Hofmann, "Inference of Chemically and Radiologically Induced Cancer at Environmental Doses," *Fourth International Symposium on the Natural Radiation Environment*, December 1987. According to Table 118 of the *Statistical Abstract of the United States 1992*, the death rate by cancer for Mountain States in 1989 was 158.0 per 100,000 resident population, versus the national average rate of 199.9. See Bast, op. cit., p. 105.

8 Ben Bolch and Harold Lyons, *Apocalypse Not: Science, Economics, and Environmentalism*, Cato, pp. 65-66.

9 Simon, op. cit., p. 204. 10 Bast, op. cit., pp. 106-107.

11 *Access to Energy*, Vol. 18, July 1991, p 1; in Simon, op. cit., p. 210.

12 *Journal of the American Medical Association*, 1989, p. 2729; in Simon, op. cit., p. 207. 13 *ibid*, p. 2728. 14 Simon, op. cit., p. 207.