

(service on the steering committee for the Committee on Nuclear and Alternative Energy Systems), in safeguards research, in decay heat research, and in nuclear economics. He regularly teaches courses in reactor physics and in nuclear fuel cycle, and occasionally in a broad spectrum of topics within his interest.

Before It's Too Late, A Scientist's Case for Nuclear Energy. By Bernard L. Cohen, Plenum Publishing Corporation, New York (1983). 292 pp. \$16.95.

This is the best book this reviewer has read that sets forth the advantages of nuclear energy and counters the misconceptions about it spread by the media and antinuclear critics. Written in language understandable by the general public, it deserves to be widely read. The book can do much to overcome the unreasoning fear of nuclear energy now felt by many Americans. Nuclear specialists wishing to advance public acceptance of nuclear energy will find the book indispensable because of its numerous, striking examples of the advantages and safety of nuclear energy compared with coal and other energy sources.

Chapter 1, "Problems in Public Understanding," explains why the public has such gross misunderstanding about nuclear power and alternative energy sources and tells how the author intends to set the record straight.

Chapter 2, "How Dangerous Is Radiation?," is a balanced comparison of the risks from exposure to radiation with the risks of ordinary living. Some striking examples: One millirem of radiation gives the same risk of being killed as driving three miles or crossing the street three times on foot. The genetic effect of one millirem of radiation is equivalent to five hours of wearing pants.

Chapter 3, "The Fearsome Reactor Meltdown Accident," compares the probability and consequences of various classes of reactor accidents and shows them to be much less serious than accidents with other technologies that are accepted without concern—motor vehicles, hazardous chemicals in commerce, coal-burning power plants, and hydroelectric dams.

Chapter 4, "Understanding Risk," is an impressive comparison of the small risk from nuclear power generation with the much greater risk from other aspects of life. For example, the average loss of life expectancy from being 30 pounds overweight is 900 days; from motor vehicle accidents, 200 days; from hydroelectric dam failures, 0.5 days; if all U.S. electricity were nuclear generated, 0.03 days. Having all U.S. electricity nuclear generated would shorten the average American's life the same amount as smoking one cigarette every 15 years. Tightening buildings to reduce fuel consumption would reduce life expectancy of occupants from increased radon exposure by 24 days and thus make this conservation measure the most dangerous energy strategy from the standpoint of radiation exposure.

Chapter 5, "Hazards of High-Level Radioactive Waste," shows that the harmful effects of properly stored high-level waste are much less than from burning coal or from commonly used industrial chemicals. Seven layers of protection prevent wastes stored underground from getting into water supplies during the first few hundred years, and after 15 000 yr the wastes are less toxic than the natural uranium from which they were generated.

Chapter 6, "More on Radioactive Waste," deals with radioactive hazards other than from stored high-level waste. From a coal-burning plant, radon, air pollution, and chemical carcinogens are shown to cause far more fatalities than radioactive wastes from a nuclear plant of the same capacity.

Chapter 7, "Plutonium and Bombs," deals with the value of plutonium as an energy resource and its dangers as bomb material or poison. The author first makes a strong case for plutonium having the potential to provide all the electric energy the world will ever need through use of breeder reactors. He then tackles the concerns about plutonium. He shows that diversion of plutonium from a nuclear power plant would not be the preferred way to make a bomb or the most effective way for a terrorist to blackmail a community by threatening to poison its water supply. Plutonium toxicity has been greatly overstated. It is much less toxic than natural toxins that can be responsible for botulism or mushroom poisoning.

Chapter 8, "Costs of Nuclear Power: The Achilles Heel," is a good account of the great increase in U.S. nuclear power costs caused by antinuclear opposition, regulatory ratcheting, and regulatory delays. It concludes with a plea for sensible, expedited regulation so that nuclear power costs in the United States can again be as low as in France, Japan, and other countries where nuclear plants are being built in half the time.

Chapter 9, "The Solar Dream," shows how the low surface density and variability of sunlight puts solar energy at an insuperable disadvantage compared with coal or nuclear energy for steady, dependable electric generation.

Chapter 10, "What The Polls Tell Us," reports the results of a questionnaire Cohen sent to members of the Health Physics Society and Radiation Research Society. The members responding believed that the public's fear of radiation was greatly exaggerated and that media coverage greatly overstated the dangers.

Chapter 11, "Questions from the Audience," lists frequently asked questions critical of nuclear power and gives concise answers that refute the criticisms. This chapter alone would provide valuable education for a person uninformed about nuclear power.

Chapter 12, "A Cry for Help," lists the reasons for public misunderstanding about nuclear power: wildly exaggerated fear of radiation, failure to understand and quantify risk, grossly unjustified fears about disposal of radioactive waste, fear of plutonium, and the romantic notion that solar electricity could or should replace nuclear energy or coal. The book concludes with the sentence "If, with your help, we can clear up the public misunderstandings . . . , we may still enjoy the wonderful blessings that nuclear power is so capable of bringing us—cheap and abundant energy forever, along with improved health, safety and preservation of our environment."

Cohen's book goes a long way toward clearing up these misunderstandings.

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February 13, 1984

About the Reviewer: No word from this Editor can add to the identity and stature of our reviewer. His impact on the nuclear community is eloquently stated through his service as a principal architect of the art of the separation of uranium isotopes in the grim days of World War II, as an administrator and educator (Massachusetts Institute of Technology, U.S. Atomic Energy Commission/General Advisory Committee, and the American Nuclear Society), and as a scholarly gentleman. He has helped shape this journal as a member of its Editorial Advisory Committee for 25 years. For this guidance and for a personal/professional association dating from 1941, I shall always be grateful. (DC)