

IN MEMORIAM: MICHAEL R. FOX

A Passionate Voice for Science

Mike Fox, who died Nov. 4, 2011, spent 40 years working in the nuclear industry and passionately advocating the benefits of nuclear technology. He was a dedicated teacher, spending as much time as necessary with those who wanted to know about nuclear, and writing carefully and clearly for the public, including several articles for *21st Century Science & Technology* and many columns in the *Hawaii Reporter*.



Courtesy of Jennifer Fox

Mike and his wife, Jennifer, in 2010.

A native of Olympia, Washington, Mike had a B.S. in mathematics and chemistry from St. Martin's College, and a Ph.D. in Physical Chemistry from the University of Washington. He began his career at the Idaho National Engineering Laboratory in 1965, and he taught chemistry at Idaho State University, before moving to the Tri-Cities area in 1973 to work at Hanford. After his retirement from Hanford, he continued to work as a consultant in the nuclear and energy areas.

Mike served as chairman of the American Nuclear Society's national public information committee for several years, and in 1985 was given the ANS public education award. He also was a member of the American Chemical Society.

Combatting Ignorance

Mike had little patience for greenies, especially ignorant ones, and he used

his devilish sense of humor to lampoon their fibs and foibles. He relentlessly marshalled the evidence to correct ecologies, in words that could be understood by non-scientists. But he also had some choice words for his colleagues in the nuclear community, whom, he famously said, "lacked testosterone," because they would not combat their anti-nuclear foes. Their compromise with green lies was for him a sin. He expected more of his colleagues than wimpery.

As American culture changed, becoming less and less knowledgeable about science, Mike's education program expanded from nuclear to include science in general. He was interested in truth, whether it concerned DDT, global warming, energy policy, risk, or a host of other issues that suffer from misinformation.

Talking to Mike was refreshing and

helpful. I knew I could count on him for sense and accuracy with technical questions, and for some humor. He was a forceful presence in person, on the phone, via e mail, or at a lectern. We only once shared the podium, as invited speakers at a conference of the Brazilian Nuclear Association in Rio de Janeiro. Not surprisingly, the topic was environmentalism.

Mike fought his cancer with the same spirit in which he fought ignorance—with knowledge and determination.

Our politics differed, especially so in recent years, but we each appreciated

the other's commitment and contributions to the fight for science and truth. We will miss Mike, and send our condolences to his wife, Jennifer, children, grandchildren, and other family members.

—Marjorie Mazel Hecht



Courtesy of Jennifer Fox

Michael R. Fox
(1936-2011)

BOOKS

Why Hanford's Nuclear Waste Cleanup Wastes Your Money

by Michael Fox, Ph.D.

Hanford: A Conversation about Nuclear Waste Cleanup
By Roy E. Gephart
Colorado: City Discovery Press, 2005
Hardcover, 388 pp., \$34.95
(available from www.dusttale.org/bookstore/)

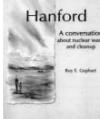
To this day, the history of Hanford, the eastern Washington laboratory of the Manhattan Project, remains largely in the minds of its retirees, and in the highly technical old reports stored in several repositories. Prior to Roy Gephart's book, the histories which have been attempted are largely (but not completely) written either by anti-nuclear critics or newcomers to Hanford. The few attempts which have been written by scientists are good as far as they go, but they are not nearly as comprehensive as the topic needs and deserves.

Dr. Gephart recognized the glaring need of setting the historical record straight regarding the activities at Hanford, and what has transpired there over the past 60 years. As such, he undertook the extraordinary task, with the support of his current employer, Pacific Northwest National Laboratories, of researching the

often garbled or exaggerated by less qualified historians. For these reasons alone, I recommend his book for anyone curious to learn what actually transpired. The book is immensely readable, complete with helpful highlights in the margins.

I have a number of criticisms of the book, however: I'll start with its subtitle, "A Conversation About Nuclear Waste Cleanup." Conversations are time, but what do conversations of the critics of Hanford, which the author provides in many places, add to the conversation? Introducing the negative comments of Hanford critics may appeal to some, but it adds nothing to the understanding of Hanford, detracts from the overall presentation of important history, and reduces the rigor needed for such an important document.

Further, the critic's comments are well known for being predictable, judgmental, and relatively free of scientific insight. A hint of this emerges as early as in the book's foreword, where the judgmental margin comments were disappointing, and continues in many places throughout the book.



involved. To this day, the quantified risks to the public from Hanford (as demonstrated in all appropriate Environmental Impact Statements) are statistically indistinguishable from zero! These risk analyses are not secret, but have been performed, and the risks quantified and published a number of times for many Hanford activities. For example, every Environmental Impact Statement (EIS) is required by law to include a study of the risks that would be incurred by doing nothing—the so-called "No Action" options. In the matter of the Interim Storage of Hanford Tank Wastes, the "No Action" option would produce estimated collective doses at the Hanford boundary that range between 2.6×10^{-4} to 1.6×10^{-2} person-rem. These are extremely small

Let's Tell the Truth About Plutonium and Hanford

by Michael R. Fox, Ph.D.

On July 10, 2010, the *New York Times* published another article about the Hanford nuclear site in Eastern Washington, this one by veteran reporter Matthew Wale. (<http://nytimes.com/2010/07/10>) It requires some corrective comments.

During World War II, Hanford was chosen by the Army Corps of Engineers to be one of the sites in what was then called the Manhattan Project. Hanford produced the majority of the nation's inventory of plutonium, including that in the bomb dropped on Nagasaki.

Having many decades of experience working at Hanford, including working with plutonium and managing a plutonium laboratory, it gets wearisome to read such superficial, inadequate, and misleading articles.

Given this specialized background, I feel an obligation to comment on the article by *Times* reporter Wale; the report he reports on, the authors of the report,"

and some of the references listed in the report. My objections include the huge lack of context, exaggerations, omissions of fact, omissions of key research findings regarding health effects of plutonium, omissions regarding interesting aspects of the Hanford environment, inadequate literature sourcing, and omission of comments on other materials such as americium.

Let's start with the headline: "Analysis Triples U.S. Plutonium Waste Figures." Nowhere in his article does the reporter provide the relative magnitudes of the before and after values. Therefore, the reader cannot assess for himself the amounts of plutonium involved. Three times a small number is still a small number, for example. As written, therefore, the headline is irrelevant and meaningless.

But in the universe of problems with this *Times* article and the report it is based on, the lack of information on "Plutonium Waste Figures" only hints at what lies ahead in terms of other inaccuracies.

The apparent purpose of the paper and the *Times* article is to create another image of looming doom related to the Hanford clean-up mission. Such dooms of impending doom from Hanford have been frequent fare from Hanford critics for more than two decades, and all of them suffer from the same litany of exaggeration and lies.

Central to the scare stories are the two familiar concepts—"deadly" plutonium and 24,000-year half-life. These have been common bugaboos since the 1970s, when the anti-nuclear forces and their friends in the media appeared in concert like Pavlovian dogs. The scare stories haven't changed for nearly 40 years, yet during this time thousands of workers operated quite safely with plutonium, because we happen to know a lot about it and how to work safely with it.

When one is managing a plutonium lab, with dozens of workers, personal safety of friends and colleagues was always of utmost importance and a no-nonsense part of everyday life. That safety effort paid off, in terms of establishing an excellent health and safety record. Obviously, we worked hard and carefully with safety training, laboratory conduct, practices, and habits.

Gee-Whizzy Half-Lives
Now for that big number: One is reminded of children discovering a gee-whizzy new word or big number for the



Photo: Jennifer Fox

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BOOKS



Two of Dr. Fox's articles on the 21st Century website: www.21stcenturysciencetech.com.