

## **We Need A New Earth Day To Correct The Old One**

By Edward J. Calabrese

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The first Earth Day, in 1970, was celebrated after a wave of environmentalism swept the nation. Many give credit to Rachel Carson's 1962 book, "Silent Spring," which popularized the notion of large-scale chemical pollution, for igniting the movement.

But she was really feeding off of a concept developed a few years earlier. The "precautionary principle" was conceptualized when the National Academy of Sciences proposed a radical change in the risk assessment of exposure to radiation and carcinogens. It recommended changing the regulatory paradigm from a "threshold dose" model to a linear one.

The threshold paradigm was what one might call common sense. It held that humans could tolerate small doses of things that, in larger doses, could be harmful.

Sunlight is a perfect example. Low doses are actually required for survival, as ultraviolet radiation — the same general type that causes sunburn — catalyzes the formation of Vitamin D. But, as is obvious to anyone who lives in a sun-drenched area, excessive exposure can lead to death in the near term (from dehydration) or the longer term (from skin cancer).

The "linear model" assumes that just a single molecule of a carcinogen or a single ionization from an X-ray can induce cancer. The enthusiasm spawned by Earth Day soon gave us brand new regulatory agencies such as the Environmental Protection Agency and the Occupational Safety and Health Administration. The EPA routinely applies the linear model to carcinogens.

The linear model is a case study in the unintended consequences of the desire to do good. In this case, an ideologically driven scientist, Nobel Prize laureate Herman Muller, whose research formed the basis for EPA's model, led the charge. A very powerful figure in health physics, he is now known to have marginalized and obstructed the publication of any research that provided evidence counter to the linear model.

If that sounds like the way senior climate scientists were found to behave in the famous 2009 "Climate-gate" emails, it should.

The regulatory agencies fell in line, as did a compliant scientific community and a media that was afraid to dig deeper. Every country followed the U.S.' lead.

The linear model is rigid, absolute and wrong. We now know that there are so many flaws or holes in the linear dose response model that it looks more like Swiss cheese. The resulting environmental regulations are having a negative impact, not only on societal costs, but on our health as well.

Over the past several decades, considerable research has revealed a plethora of life-saving adaptive processes that can be used to enhance the quality of life and to extend life. Our cells are flexible, adaptive and can actually be strengthened via low-level exposure to a large number of compounds that the EPA would like to regulate down to the last molecule.

Instead of preventing harm, the precautionary principle actually causes harm. The entire therapeutic model is built around the notion that certain compounds that are highly toxic in large doses can be life-enhancing and life-extending in low ones.

How can the regulatory community accept the linear model when so many of its senior practitioners are living lives that prove the opposite? Many of these aging regulators are taking ACE (angiotensin converting enzyme) inhibitors to control blood pressure. The original ACE inhibitor, Captopril, is the active substance in the venom of the Brazilian viper. A lot will kill you very quickly. A little could extend your life for decades.

We need a new Earth Day. It should be dedicated to righting the past deceptions and correcting the ongoing errors in environmental regulation. It should be one that acknowledges our adaptive responses to what, in high doses, can cause cancer, but, in low doses, can improve our well-being.

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