

## You Can't Stop Progress!

*Development will conquer the diseases of the poor,  
By spraying all the houses and by putting in the sewer,  
And we'll know we have success in our developmental pitch,  
When everybody dies from the diseases of the rich.*

Economist Kenneth E. Boulding (1969, p. 3)

*Be Content with what you have; rejoice in the way things are. When you realize there is nothing lacking, the whole world belongs to you.*

Lao Tzu

*There are three kinds of men: The ones that learn by reading. The few who learn by observation. The rest of them have to pee on the electric fence and find out for themselves.*

Will Rogers

All the invited participants for the week-long conference on “The Careless Technology” in 1969 were seated in alphabetical order in a large circle for the entire week. As a result, I had the great pleasure of sitting on Ken Boulding’s right hand while he composed the entire “Ballad of Ecological Awareness.” It is a masterpiece and was used as the conference summary. I first realized what Ken was doing when he asked me: “What rhymes with schistosomiasis?” Ken had a superb sense of humor.

Ken’s rhyme above on the diseases of the rich is still valid over 40 years later.

As is common with many countries as they industrialize, the usual plaques of poverty – infectious diseases and high infant mortality – have given way to diseases more often associated with affluence, such as heart disease, stroke, and cancer. . . . Lung cancer is the most common cancer in China. Deaths from this typically fatal disease have shot up nearly fivefold since the 1970s. In China’s rapidly growing cities, like Shanghai and Beijing, where particulates in the air are often four times higher than in New York City, nearly 30 percent of cancer deaths are from lung cancer. . . . Coal burning is also a major emitter of carcinogens and mercury, a potent neurotoxin. Coal ash, which contains radioactive material and heavy metals, including chromium, arsenic, lead, cadmium, and mercury, is China’s number one source of solid industrial waste (Larsen 2011).

Humankind should reexamine the human cost of economic growth. Despite the misleading publicity, “clean coal” is not yet available, even though, in the United States, a significant number of people still believe it exists. If “clean coal” ever becomes a reality, it will be expensive, and the trapped high risk components will still have to be located somewhere – in “someone’s backyard.” The desire for cheap energy or corporate profits places future generations at serious risk.

Burning fossil fuel, such as coal, produces an enormous amount of carbon dioxide. As the amount of carbon dioxide continues to rise, so does ocean acidification. Marine ecosystems are at risk globally from “impairing the ability of organisms to form shells or skeletons” (Kelly et al. 2011). Coping with oceanic acidification at a global scale is a daunting challenge, but dealing with acidification of coastal areas locally may be obtainable (Kelly et al. 2011). Coastal communities will also have to cope with sea level rise caused by climate change from carbon dioxide and other greenhouse gases.

Alternative sources of energy to coal exist. Policymakers often tout a mix of sources including nuclear, wind, solar, and geothermal. However, events at the Fukushima nuclear power plant in Japan have raised many practical considerations about the risks of nuclear power. One of the problems is that people pay little or no attention to what has happened in other countries or even parts of their own country, and no substantive discussion occurs in the media of experiences with uranium mining elsewhere. “Tailings,” waste material after processing uranium, can be huge in volume and are not without risk. Late in the 20<sup>th</sup> century, many tailings piles were transported from areas where they posed a significant risk to areas where they were buried underground, decreasing human exposure to radiation and

preventing redistribution by strong winds. Relocating tailings is an expensive process and involves a significant degree of risk since small particles of radioactive dust can be blown away if the tailings are not covered.

In humanity's quest for "progress," ecological tragedies, such as the British Petroleum massive oil leak in the Gulf of Mexico in April 2010, have a tendency to be discounted. Hasty responses to ecological disasters usually involve statements that ecosystems are tough, not fragile, because some species have either recolonized the damaged area or some individuals of some species managed to survive. These responses indicate why a distinction must be made between loss of biodiversity and biotic impoverishment. Reports began to appear after the catastrophic explosion at the Chernobyl nuclear power plant in 1996 that a dead zone was ". . . no longer a wasteland . . . but rather a lush wildlife refuge . . ." (Featherstone 2011). However, no robust evidence indicates as yet that this situation was due to radiation. The area around the Chernobyl reactor itself remains an "exclusion zone," and humanity is creating zones of alienation on a regular basis (Featherstone 2011). Each represents loss both to the Biosphere and to humankind. How many more of these losses can humankind afford? How many more can the Biosphere afford?

The Fukushima nuclear catastrophe in Japan was first graded 5 and then was raised to 7 on the international scale of nuclear catastrophes, making it comparable to Chernobyl. The scale is based on the estimated total amount of radiation released and the estimated human health and environmental impacts (Featherstone 2011). However, like Chernobyl, the initial estimates will probably be too conservative. Even so, the Fukushima events have resulted in a shift in public sentiment worldwide against nuclear power plants, and "The crisis at Fukushima Daiichi and government pledges to rethink energy policy from a 'blank slate' have sparked widespread speculation that Japan will abandon plans for new reactors, spelling the eventual end of an atomic sector that until this year accounted for nearly 30 per cent of electricity generation" (Dickie 2011). In contrast, "Germany announced . . . it would become the biggest industrial power to completely give up nuclear energy following the crisis at the Fukushima plant in Japan, saying that all nuclear reactors would be shut by 2022" (Politi 2011).

The major, unaddressed issue on nuclear power plants is that nuclear catastrophes are global problems that are still being addressed nation by nation. The Chernobyl catastrophe spread radiation to practically all of Europe, and, since a major portion of the Fukushima radiation is draining into the Pacific Ocean, it will almost certainly have a wide distribution in both marine and terrestrial systems. "A study has found that radiation from the plant [Fukushima] has spread over 230 square miles, . . . suggesting that there could be a Chernobyl-like 'dead zone' if the government doesn't act quickly to decontaminate soil" (Politi 2011).

As the climate situation worsens, such as the still increasing anthropogenic greenhouse gas emissions (BBC News 2011), more curious "solutions" will emerge from non-scientists — Representative Dana Rohrabacher, a Republican from California, has suggested during a Congressional hearing ". . . that clear-cutting the world's rain forests might eliminate the production of greenhouse gases responsible for climate change . . . . Forestry experts were dumfounded by Mr. Rohrabacher's line of questioning, noting that the world's forests currently absorb far more carbon dioxide than they emit — capturing one-third of all man-made emissions and helping mitigate climate change" (Rudolf 2011). Despite this obvious lack of knowledge of the world's forests, no outright expression of outrage has been voiced by the general public.

"You can't stop progress!" is a badly outmoded viewpoint left over from the days when cheap, abundant energy provided the illusion that humans had conquered nature — which was never true and never will be! Mother Nature, i.e., the universal laws of physics, chemistry, and biology, will always prevail. Life on Earth has had five mass extinctions of species and has always rebounded with a huge number of new, quite different species. Nature can "afford" huge losses of species and individuals and life goes on by replacing the losses in evolutionary time. In the sixth great extinction, now in progress, many species have already become extinct, and the end is not yet in sight. *Homo sapiens* might yet survive since it is the major factor in the sixth great extinction.

Survival might be accomplished by redefining progress as living sustainably in harmony with the present Biosphere by not violating the universal laws of biology, chemistry, and physics. A good start would be to cease ". . . the war on climate science and scientists that's going on now" (Kerr and Kintisch 2010). Civilization cannot reject science and survive. Science is based on peer-reviewed evidence — facts to use for quality living and survival. Science is a process, not a specified discipline, and science must be accepted as such. No amount of money, disinformation campaigns, or vocal merchants of doubt can suppress the universal laws. Billions of dollars cannot protect an individual, a nation, or a special interest group. If humankind continues "business as usual," it will experience the "dark side of nature" (pages 141-143 in this volume)!

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