Preface

Climatologists, ecologists, and indeed all scientists who conduct research on the environment's capacity to maintain the quality of life for humanity are increasingly and sadly aware of three intertwined threats to human welfare. One is the harm being caused to air, water, soil, and life on Earth by such human actions as burning fossil fuels and abusing our land. The second is the ever-increasing number of human mouths to feed and thirsts to quench. But the third is the most dangerous, for it not only promotes the first two threats but also extends its reach to every facet of humanity's effort to govern itself rationally. It is the growing rejection of the premises, methods, and findings of science. John Berger's book, while concerned with climate science, serves a broader purpose by providing an antidote to a poisonous corruption of rationality that afflicts our society today.

Millions of Americans have doubts about whether global warming science is good science and a substantial proportion of our population has doubts about evolution. Now, denial of the findings of science can be a relatively harmless pastime provided it is done in the privacy of one's home. Indeed, the Constitution guarantees all of us the right to spout the most preposterous nonsense, so there will always be those who distort the findings of science. But it is a different matter altogether when creationists threaten to alter public school curricula, or when anti-science emanates from our legislative bodies and threatens to tear the legal fabric that protects our environment and society. In such instances, the citizens of a democracy *must* speak out in defense of rationality. *Climate Myths* does so to help ordinary citizens understand the contrived myths and manufactured controversy that opponents of climate science have propounded.

Some of anti-science's popularity derives from a general failure of U.S. science education. The problem is not a failure to provide scientific information to the public (we do plenty of

that, and we do it well) but rather to inform the public about how science works. Thus deniers of global warming science say, "Global warming has not been proven—it's only a theory." Similarly, creationists delight in stating that, "Evolutionary theory has not been proven." This despite the fact that science can never prove anything—only mathematicians do proofs.

By contrast, in science we collect evidence and probe the natural world for testable ideas called hypotheses (or theories) that have predictive value. When the world is thus explained using these scientific processes, the results are not theories in a pejorative sense, but they represent the best provisional answers that science and society can presently provide. To disregard these findings in favor of the climate myths debunked in this book, for example, just because a more refined scientific theory may come along in the future, is the height of folly.

It is one thing for politicians and commentators who dislike the message of global warming to restrict their anger to the messengers—scientists. This is reprehensible, but is not the worst of the problem. Increasingly, those who hate the message are attacking not just the messengers, but the very language and rules of science (see Paul and Anne Ehrlich's *Betrayal of Science and Reason*,[a] or Naomi Oreske and Erik M. Conway's *Merchants of Doubt*[b]).

Science is built upon an ethical and logical framework comprised of peer review, controlled experiments, and the acceptance of, not the deliberate twisting of, a common terminology. Those who loathe the findings of global warming science or evolution have gotten away with undermining this framework because the general public is not familiar with the

[a] Paul R. Ehrlich and Anne H. Ehrlich, *The Betrayal of Science and Reason: How Anti-Intellectual Rhetoric Threatens Our Future* (Washington, D.C. and Covelo, CA: Island Press, 1998).

[b] Naomi Oreske and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues From Tobacco Smoke to Global Warming* (New York: Bloomsbury Press, 2010).

process of science. The public considers the word "theory" to be synonymous with idle speculation, even though, when scientists refer to the theory of relativity or of evolution, they are referring to our highest level of accumulated knowledge. Purveyors of anti-science prey on this confusion. *Climate Myths* helps dispel it by laying out the clear, irrefutable facts that science has provided about climate change.

To understand the damage, consider the alternative. Consider a citizenry that understands the nature of scientific evidence, that recognizes when it is conned by commentators, and that has the numeracy skills to know when it is being bamboozled by practitioners of mathematical malpractice. Such a citizenry is *not* going to allow governing bodies to be guided by anti-science. It would not allow their government to continue to override the scientific findings of the nation's most distinguished scientists—as many of our influential politicians have been doing over global warming, arsenic in drinking water, forest protection, and many other issues.

When political leaders rely on quackery to bolster their case to overturn the rules and regulations that protect citizens from polluting and looting our natural heritage, they are really not merely overturning a legislative legacy of several decades. They are doing something even more damaging—overturning a 500-year legacy of civilization that has steadily replaced faith in irrationality with understanding of, and acceptance of, the process of science. The long-term consequences of such actions will reverberate through the coming decades in ways that will degrade far more than the health of our environment and our material well-being; they will erode the very foundations of our democratic society.

Two hundred years ago, Thomas Jefferson understood this fragility of democracy well. He knew that an illiterate citizenry would be unable to sustain the institution of democracy and for that reason, he greatly expanded access to public education. With the passage of 200 years and the ballooning

of technological capacity, it is equally important now that citizens possess a basic acceptance of the methods and findings of science.

Many interest groups are pushing in the opposite direction, toward an "Age of Endarkenment." At the forefront are those who simply cannot accept the authority of science and who loathe having government take the steps needed to heal the environment, even when those same steps are probably also needed to heal our economy and sustain our future. The reason appears to be flat-out hatred of the concept of government. This is individualism turned cancerous.

The problem is not religion. I returned recently from two months of sabbatical research and travel in three countries: Turkey, a largely Muslim country, Bhutan, a Buddhist nation, and Andalucia in Spain, a largely Catholic nation. The overall understanding of global warming amongst the admittedly small cross-section of people I spoke with was refreshing and consistent. On the world stage, where international negotiations over climate treaties take place, and at the local level, where societal support for clean technology matters, these nations look much more like leaders than do we. *Climate Myths* dispels the myth that adhering to international climate treaties is a forfeiture of national sovereignty, and shows why the U.S. ought to take a leadership role in promoting an effective international climate treaty.

John Berger's useful book explains the science of global warming and debunks the myths created by those who deny the relevant science. Another useful, indeed essential, task is to better communicate to the public the ethical foundation of science. Some call this foundation "the scientific method." But the stodgy manner in which "method" is explained in high school textbooks tends to be off-putting. The scientific method is based on ethical premises, but we don't seem very good at talking about them. Perhaps we need to spend more time describing how the sheer joy of scientific discovery, and the beauty

it reveals about the natural world, stem less from individual brilliance than from the collective acceptance by a community of scholars of a set of rules, a scientific ethic, that constitutes not merely a "method," but more importantly a covenant that has been empirically reinforced over 500 years of human history, and is now under severe attack by opponents of science and by climate science deniers.

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