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# ClimeApocalypse!

## Or just another line item in the budget?

**In the year 2393** a historian in the Second People's Republic of China penned a book about how scientists, economists and politicians living in the 21st century failed to act on the solid science they had that gave clear warnings of the climate catastrophe ahead. As a result, the world experienced the Great Collapse of 2093, bringing an end to Western civilization.

So speculate historians of science Naomi Oreskes of Harvard University and Erik Conway of the California Institute of Technology in their book *The Collapse of Western Civilization: A View from the Future* (Columbia University Press, 2014), a short scientific-historical fantasy. During the second half of the 20th century—the "Period of the Penumbra"—a shadow of anti-intellectualism "fell over the once-Enlightened techno-scientific nations of the Western world … preventing them from acting on the scientific knowledge available at the time and condemning their successors to the inundation and desertification of the late twenty-first and twenty-second centuries."

Why the failure to act? The authors' future historian posits several causes: blind optimism; religion; reductionism that prevented scientists from understanding holistic systems; disciplinary narrowness that restricted cross-field communication between scientists; adherence to avoiding type I errors (believing a hypothesis is real when it isn't) over type II errors (not believing a hypothesis is real when it is); and insistence on a 95 percent confidence limit for statistical significance that caused scientists to dismiss as unproved climate effects caused by warmer weather, such as tornadoes and hurricanes. Between 1751 and 2012 more than 365 billion metric tons of carbon was released into the atmosphere, causing temperatures to increase, the historian notes. Another century of warming devastated the populations of Australia and Africa, and those of Europe, Asia and North America had to move inland from flooded coastal regions.

This science-historical fantasy is thought-provoking, but is it prescient? Global warming is, of course, real and caused by human activity. But predicting how much warmer it is going to get and what the consequences will be is extremely difficult because estimates include error bars that grow wider the further out the models run. The precautionary principle states that we should act, just in case. But act on what? Climate change is not our only problem, and we do not have unlimited resources. Which problem should we tackle and how much should we spend?

In the second edition (2014) of his book *How to Spend $75 Billion to Make the World a Better Place,* Bjørn Lomborg reports the findings of a study sponsored by his Copenhagen Consensus Center 2012 project in which more than 50 economists evaluated 39 proposals on how best to solve such problems as armed conflicts, natural disasters, hunger, disease, education and climate change. Climate change barely rated a mention in the top 10, which included, in order, malnutrition interventions, malaria treatment, childhood immunization, deworming of schoolchildren, tuberculosis treatment, research and development to increase crop yields, early-warning systems for natural disasters, hepatitis B immunization, and low-cost drugs for acute heart attack. Number 12 was R&D for geoengineering solutions to climate change, and number 17 was R&D for green energy technologies. The rest of the top 30 were related to disease, water and sanitation, biodiversity, hunger, education, population growth and natural disasters.

The ranking is based on a cost-benefit analysis. For example, an investment of $300 million "would prevent the deaths of 300,000 children, if it were used to strengthen the Global Fund's malaria-financing mechanism." Another $300 million would deworm 300 million children, and $122 million would lead to total hepatitis B vaccine coverage and thereby prevent another 150,000 annual deaths. Low-cost drugs to treat acute heart disease would cost just $200 million and save 300,000 people.

This doesn't mean we shouldn't do more about climate change. But what? Both books posit technological solutions: Lomborg's Copenhagen experts recommend spending $1 billion for research on planet-cooling geoengineering technologies; Oreskes and Conway have humanity saved by the creation in 2090 of a lichenized fungus that consumes atmospheric carbon dioxide. Whatever we do about climate, we should recognize that the world has many problems. If you are malnourished and diseased, what the climate will be like at the end of the century is not a high priority. Given limited resources, we should not let ourselves be swept away by the apocalyptic fear generated by any one threat. SA

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