

that question is, undeniably, important, and not getting it right could have significant consequences, but the cheap shots in the PHYSICS TODAY story are good neither for the publication nor for the science it is supposed to support.

Although there is significant evidence that global warming is occurring, and models strongly suggest that it is due to human activity, climate change promoters go beyond science to characterize global warming as bad or destructive. That is no longer science but evaluation, which moves their pronouncements into the realm of politics. If they wish to be treated like scientists, they should stick to science—reporting facts as measured and correlations as inferred—and leave the inferences and implications to leaders who are used to and prepared for the vicissitudes of politics. If climate change promoters choose to enter that arena, they must expect to abide by its norms, not the more refined ones we strive for in science.

Proposers should recognize that whether change is good or bad depends on much more than the simple fact of change. To give an example, the opening of the fabled Northwest Passage because of ice melt likely will have a negative impact on the economy of Panama, but it will reduce both transportation costs and carbon monoxide emissions from ships engaged in world commerce.

I certainly agree that science “should be the ultimate tool,” but let’s make it good quality science. If the models are so good, did we just not hear about their predictions of what Toni Feder reports as “decade-long periods with little or no warming”? And if not, why not?

There is no better evidence of the political nature of the actions of climate change proposers than the formation of the Climate Science Rapid Response Team. Neither Charles Darwin nor Isaac Newton needed gangs to support or defend them.

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■ **Thank you** for helping to bring to light the actions of the fossil-fuel interests’ cronies. I found it refreshing to see their laundry displayed to the public in such an intelligent publication as PHYSICS TODAY.

Such deplorable acts lose their power when we come together against them in this way.

To freedom of science!

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■ **After reading** “Climate scientists not cowed by relentless climate change deniers,” I am dismayed by the bellicose and militant tones in the rhetoric attacking the deniers. Those are the deniers’ tactics—and they are much better at it. We scientists are meant to be calm, rational, fair, and levelheaded. If we aren’t, we will lose to the deniers.

What should we climate scientists do about this very real conflict?

First, we need to understand who the climate change deniers are. Simply put, they fall into three groupings: fossil-fuel interests and others who militantly oppose government regulation of any kind; people with spiritual and religious understandings that conflict with the reality around them; and those who simply don’t understand climate change and are fearful. To be successful in addressing global warming, we will have to change those people’s hearts and minds.

The focus of the actions of individuals and groups mentioned in the article is on global warming deniers in the fossil-fuel industry. The hope is that by presenting the facts to those deniers they will change their ways. A better approach might be to first learn about their milieu and how they cope with their legal and fiduciary responsibilities to their stockholders, employees, communities, government agencies, and rate payers. Knowing those details may point out ways for us, as scientists and fellow citizens, to assist them in taking the difficult and costly actions to reduce or reverse global warming. As beneficiaries and rate payers of the products they have made, we must also be willing to share in the costs of those actions.

Within the grouping of faith-based deniers are those whose fundamental beliefs are based on what are, to them, absolute truths. However, all the major religions have leaders who are striving to reconcile those truths to a changing world. Scientists can help in that process by determining what was humankind’s understanding of the natural world at the time of the holy writings and by reconciling those truths to a changing—and warming—world.

Finally, there are deniers who are wary of change because they don’t understand it and are thus prone to fears of the unknown. Their lack of understanding may be due to shortcomings in their education in math and science and to parental concern about their education. The scientific community has been aware of such shortcomings for

years and has striven to correct them. The problem now is how to reach the adults in this group after they have left school and are now voting. To do that, we should better use mass communication technologies and enlist noted athletes and media personalities to further educate them.

Other actions for solving our problems include the following:

► Be aware that it may be good publicity to scientists that Al Gore shared in the Nobel Peace Prize, but to deniers it is like waving a red flag before a raging bull. To them, he is the symbol for an all-wise elite that regards itself as intellectually superior to them.

► Be alert to acts by the scientific community that reinforce the perception of elitist superiority. The reputation of the scientific community has not been abetted by some scientists’ overreactions to recent oil spills and their effects. What was deemed a “disaster” would have more appropriately been called a “mess.”

Global warming, still at the mess stage, can be stopped and, hopefully, reversed if we use all the available remedial technologies, social and political institutions, and financial resources at our disposal. If we don’t, it will become a disaster, with unimaginable consequences.

Less hubris and a lot more humility would do wonders for the reputations of us scientists and enhance our chances to contribute to remedial actions.

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■ **Interesting wording** in “Climate scientists not cowed by relentless climate change deniers.” The word “denier” has already been subsumed by the fabric industry as a measure of weave density—used, for instance, to quantify the opacity of pantyhose. I respectfully propose that we burden the “deniers” with a “y” if they persist with their denying.

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Boundary conditions and Maxwell’s equations

The article on black hole mergers by Thomas Baumgarte and Stuart Shapiro (PHYSICS TODAY, October 2011, page 32) was extremely well written and informative. I especially appreciated