

Can science abide political causes?

The Double Standard in Environmental Science

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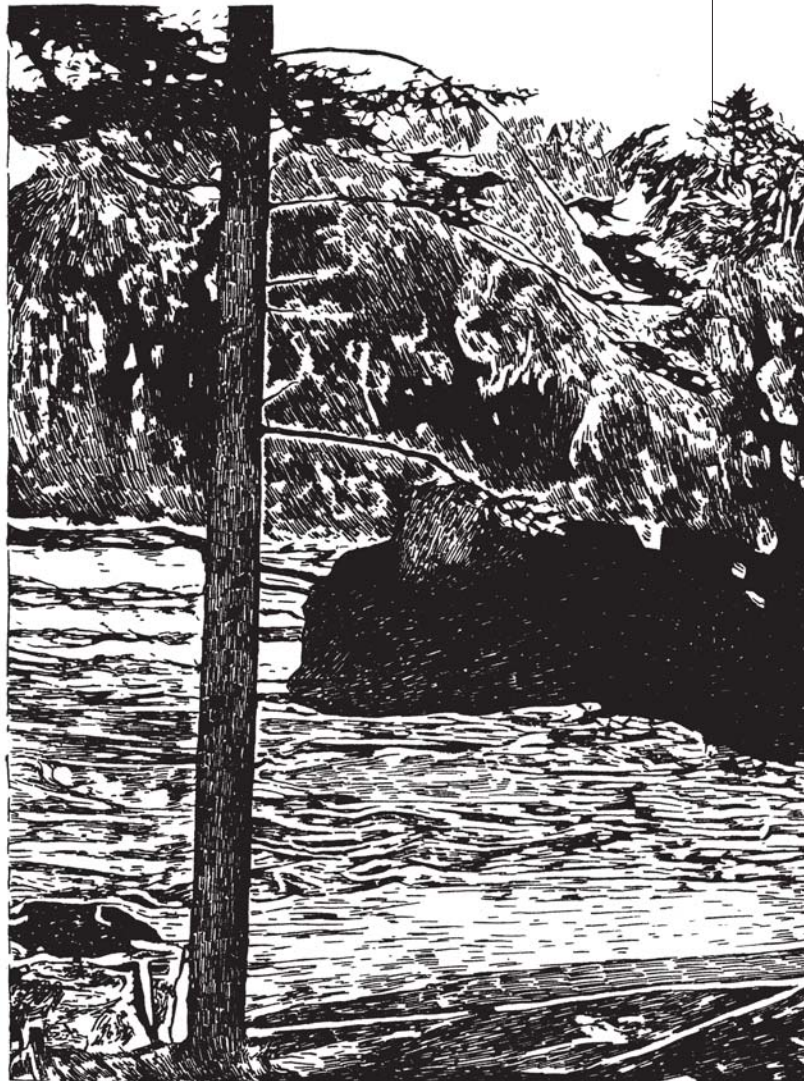
'Everyone knows that soil erosion is a U.S. crisis. This study can't be right." That statement is a paraphrase of a reviewer's comments on a paper on greatly declining rates of U.S. soil erosion that I submitted to the journal *Science* in 1982.

For *Science*, as a matter of policy, it took only one negative review to reject my paper; the reviewer's disbelief meant the journal would not publish my findings. No matter that the study was sponsored by several government agencies and overseen by the U.S. Geological Survey, that it had involved thousands of person-hours by three generations of scientists over a period of 44 years, and that it had used precise and massive on-the-ground measurements to reach its findings. My offense was demonstrating that soil erosion in one region of the Midwest was only a small fraction of what it had been in the 1920s and 1930s, with the clear implication that the same improvements were occurring elsewhere in the country.

My experience suggested to me that ideology, not science, had established a significant grip on the top scientific press. This article attempts to portray the emotionalism, exaggeration, and even ideological viciousness — qualities that to me define extremism — that have invaded the field of environmental science. It also considers the different standards of evidence required for pessimistic, as opposed to optimistic, views on environmental problems. As a backdrop, I will use my own specialty, soil erosion. This article also considers the scientific objectivity of some prominent, if perhaps extreme,

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Professor Trimble thanks the over 50 environmental scientists and policy specialists who have critiqued this essay and have provided encouragement. The essay is dedicated to the memory of Pierre Crosson, whose influence it bears.



players in environmental science and the implications of some of their actions.

HEROES AND HERETICS

It should have been clear to me well before 1982 that there was a new Zeitgeist. The continuing doomsday pronouncements of Paul Ehrlich had gotten him (and still get him) unending appearances on late night television, rock-star status on college campuses, and seemingly unlimited access to influential platforms in top scientific journals. Ehrlich has his critics, of course, but he summarily dismisses them — hardly the essence of rational scientific dialogue.

And there are many other environmental bandwagons being promoted. Starting in 1984, the annual *State of the World* report by the World Watch Institute (WWI), headed by Lester Brown, has become a major crisis mill. The specialty of WWI is serving up huge doses of theorized Malthusian starvation on a worldwide scale, sometimes based on inflated soil erosion predictions. This group, like many others, rarely encounters a mere environmental problem; it is always a crisis and, as with Paul Ehrlich, doomsday is just around the corner if draconian steps are not taken immediately. Like Ehrlich, Brown has been well rewarded for his trouble, in this case receiving a MacArthur Foundation “genius” award and the UN Environmental Prize, and has been described by the *Washington Post* as “one of the world’s most influential thinkers.”

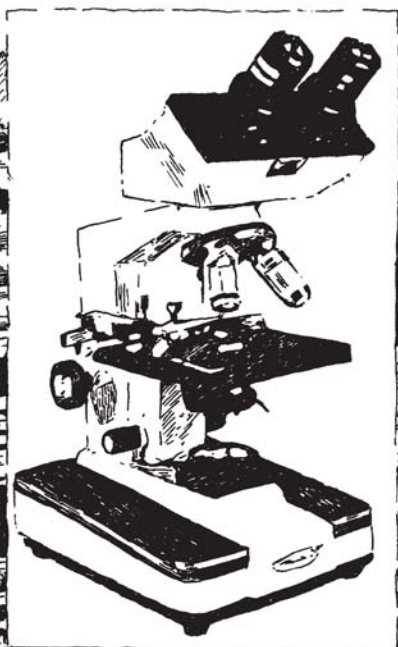
SIMON’S WAGER While I have been involved in environmental science for almost 40 years, I am not politically active. I learned early on to avoid academic bandwagons of any sort and that true scholarship can scarcely abide political causes. My own teaching, research, writing, and family commitments left me little time and I must admit that I was not following

the more general environmental debates.

With discretionary time as a Fulbright fellow at Oxford in 1995, I accidentally discovered the work of the late American economist Julian Simon. I had earlier heard of Simon’s famed bet with Ehrlich about the future scarcity of a basket of natural resources. In 1980, Simon offered to bet \$10,000 that any specified raw material would drop in price over time. Ehrlich and two colleagues gleefully accepted the bet, commenting that “the lure of easy money can be irresistible.” Ehrlich and the others selected chromium, copper, nickel, tin, and tungsten, with a time lapse of 10 years. Adjusted for inflation in 1990, all five metals had decreased in price, tin by 74 percent. Simon won the bet.

In his books and other writings, Simon appeared to have a series of well-reasoned arguments that countered many of the more extreme environmentalist claims. I thought his work very interesting, if maybe overdone, and wondered if the more emotional of the environmental crusaders had seen it. A few weeks later, while in a cocktail party conversation with another visiting American (a clearly committed Green), I mentioned having read and appreciated Julian Simon. The reaction was akin to having insulted his wife — I was stunned by the vitriol he dumped on Simon, and on me for even having mentioned Simon in any positive light.

As I learned more about the Green vendetta against Simon, it became clear that the problem was not that Simon was wrong — although certainly he was not right on all counts (no one ever



is). Rather, the problem seemed to be that his contrarian views were correct to the point that he could not be dismissed easily. Thus, the tactics had sometimes descended to the level of personal attacks and simply trying to drown him out. And there was the impression that more had to be done than simply proclaim him wrong; he must also be made to look a fool, which Simon certainly was not. Of course, the similar tactics of political correctness — inbred groupthink, suppression of dissent by ridicule, and even outright prohibition and isolation of contrarians — were already familiar to anyone on an American university campus. It was not necessary to logically *disprove* ideas with which one disagreed; it was only necessary to vehemently *disapprove* of them, a stance that strikes me as ideological, religious, or both. What we were seeing with Simon was what we often saw on campus — the religious declaiming the heretic.

LOMBORG In recent years, no one has been more heretical than Bjørn Lomborg. At the time that he began work on what would become the book *The Skeptical Environmentalist: Mea-*

(Presumably, only moderately serious researchers might have discovered a few more correct points.) Pimm was referring to a series of reviews on the website of the Union of Concerned Scientists. (One wonders what the reviews of totally unconcerned scientists might have said.)

At only a slightly higher level than the Pimm-Harvey review was a fusillade of criticism against Lomborg in *Scientific American* (January 2002), bearing the subtitle “Science Defends Itself Against The Skeptical Environmentalist,” suggesting that this fine, old (but unrefereed) journal was giving up all semblance of scientific objectivity. Indeed, Lomborg was denied participation in the initial publication, and then denied adequate space for response both in the journal and on its website. When he posted his response along with the original text on his own website, the journal threatened him with a lawsuit, leaving him in the lurch. (Lomborg was later able to post a detailed reply on his website, www.lomborg.com.) But little matter; while legitimate criticisms of the book could have been made, all of this bluster had refuted very little of any con-

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asuring the Real State of the World, Lomborg was an unlikely apostate: a clearly bright Danish statistician in his 30s with a newly minted Ph.D. from the University of Copenhagen. He was gay, a socialist, a vegetarian, a member of Greenpeace, and he rode a bicycle. As an exercise for his students at the University of Aarhus, he smugly set out to show just how wrong Julian Simon was. But as it turned out, Simon was mostly right and his detractors were mostly wrong.

This eventually culminated in the 2001 publishing of *The Skeptical Environmentalist* by Cambridge University Press. In this massive book of over 500 pages and almost 3,000 footnotes, Lomborg identified the main tenets of the environmental faith, terming them “the litany.” Note that the religious connotation of “litany” as rote indoctrination was not accidental, nor was it then or now inappropriate. He then proceeded to show that each item of the litany was false, exaggerated, or misleading to some significant degree.

The reaction from the environmental establishment to Lomborg’s book was massive and ranged from generally negative to apoplectic. Perhaps the low point was a review in *Nature* (Nov. 8, 2001) by Stuart Pimm and Jeffrey Harvey, in which they likened the book to Holocaust denial and included a website (www.anti-lomborg.com) that featured (and still does) a physical assault on Lomborg at Oxford. Later, also in *Nature* (March 8, 2002), Pimm said that “very serious environmental researchers have gone through chapters and found that [Lomborg] practically doesn’t get a single point right.”

sequence and ironically served mainly to increase sales.

In general, the major criticisms of Lomborg were that he used unrefereed secondary sources rather than refereed primary ones and that, as a statistician, he was unqualified to tackle the specialties of environmental science — criticisms to which we will return shortly. But much of the criticism was more sinister, revolving as it did around suggestions or outright allegations of malevolence, ignorance, incompetence, or dishonesty. The only critical review of any substance in the top scientific literature was by Michael Grubb in *Science* (Nov. 9, 2001) wherein he mostly engaged Lomborg on scientific issues. But he did misrepresent Lomborg’s views on the cause of environmental improvement, asserting that Lomborg denied any role of government regulation, whereas Lomborg had indeed recognized the role of government. Grubb also erred in stating that Lomborg’s message was not to worry, an assertion that led to the derisive *Science* subtitle “Manna from Heaven” for Grubb’s review. What Lomborg in fact advocated was concentrating amelioration on the most egregious problems, and then only as good scientific evidence suggested. None of these major journals allowed much public commentary concerning the unfair treatment of Lomborg, the major exception appearing in *Nature* (March 28, 2002) in which Roger Pielke, Jr. called the campaign against Lomborg “character assassination and pressure politics.”

At the same time, an even darker campaign was being waged against Cambridge University Press, which was called upon to fire the editor responsible for handling *The Skeptical*

Environmentalist. David Schoenbrod, writing in the December 2002 issue of *Commentary*, reported that although the book had been favorably reviewed by four senior people (three earth scientists and one social scientist), 12 “prestigious scientists served a writ on Cambridge University Press, demanding that it cease printing *The Skeptical Environmentalist*, hand the book over to a nonacademic press, and convene a tribunal to investigate its errors.” Others threatened to boycott the publisher. But Cambridge University Press held firm on all counts, testimony to the integrity of the press and particularly to Chris Harrison, the editor involved.

Lomborg’s detractors made much of his use of unrefereed publications in his work. Yet with the exception of the platforms facilely provided them by *Science* and *Nature*, almost all of their responses were made in unrefereed outlets, most notably on the Internet, and their partisan misuse of the unrefereed *Scientific American* has already been mentioned. Cambridge University Press offered them the opportunity to propose a book offering opposing arguments to Lomborg, *but there was no response*. Thus, it seems clear that Lomborg’s detractors had little interest in engaging him on an intellectual plane. Rather, they chose the route of intimidation. And, in any case, such an hysterical reaction begs the question: How could a book portrayed by its critics as so inept be any threat to the environmental movement?

But the environmental zealots were not through with Lomborg just yet. After being heavily lobbied by Lomborg’s critics to do so, a political entity called the “Danish Committee on Scientific Dishonesty” (DCSD) found that Lomborg’s book displayed “systematic one-sidedness” and was “dishonest,” although the committee gave no examples, nor was Lomborg allowed rebuttal. The 16- page report was flimsy, drawing heavily on accounts from *Time* and the infamous *Scientific American* piece. Even so, Peter Raven, the president of *Science*’s publisher, the American Association for the Advancement of Science (AAAS), at that time euphorically endorsed the report, stating in the *New York Times*, “This is a just outcome that ought to bring [Lomborg’s] credibility to a halt except for those who desperately want to believe what he says.” *Science* lamely termed the inquisition an “investigation” but wisely made no mention of Raven’s pronouncement. But *Science* then solicited an equally injudicious statement by Pimm (again) that the ruling “serves as a warning to people who think they can hijack the scientific process.” To its credit, *Nature* criticized the report, quoting Anthony Trewavas that the report “comes down almost to censorship.”

Censorship, indeed. And wrong too, as it turns out. On December 17, 2003, the Danish Ministry of Science, Technology, and Innovation, the ministry that oversees the DCSD, repudiated and overturned it, saying that the judgment was not backed up by documentation and was “completely void of argumentation,” “dissatisfactory,” and “emotional.”

So what we had here was a political rendering of science — a kangaroo court. One is left to wonder if the judgment of Peter Raven, Stuart Pimm, and indeed, *Science*, is any better on matters scientific than it was on evaluating the “judgment” of the DCSD. In an article in the *Journal of Information Ethics*, a

group of scientists recently reviewed the opposition to Lomborg in the light of accepted scientific ethics. They concluded that even if Lomborg had it all wrong, most of his detractors were guilty of scientific misconduct. The entire Lomborg debacle is a shameful episode in the history of science.

Science and *Nature* come up often in this article. There is a huge range in the quality of scientific literature, and to understand the power of *Science* and *Nature*, one must know that they have 10–20 times the impact of even the top specialty journals in any field as measured by citations of their papers in the scientific literature. This influence has justly resulted from a long tradition of rigorous and disinterested vetting of submitted scientific work. Space is very limited and these journals must necessarily print only the ostensibly best work, which means that only a small percentage of submitted papers are eventually accepted for publication. *Science* and *Nature* are truly major gatekeepers of science; indeed, they are the gold standard. They, therefore, have a special obligation to objectivity and even-handedness. But it seems clear that they sometimes have not maintained their charge as it pertains to environmental science.

ENVIRONMENTAL SCIENCE AND OBJECTIVITY

In a sort of ultimate irony, Lomborg later became director of Denmark’s Environmental Assessment Institute and *Time* recently named him one of the world’s 100 most influential people, so his three years on the cross ended mostly well. But the biased people and institutions that unprofessionally attacked Lomborg are still in power. *Science* and *Nature* still provide platforms for environmental alarmists like Stuart Pimm and David Pimentel, calling on them to review books and comment on items like the DCSD judgment. Did anyone at *Science* or *Nature* not know what Pimm would say when called upon? Are there no people in the scientific community who could provide an objective opinion on environmental matters, and would *Science* and *Nature* not know who those people are?

It is that lack of internal criticism and scholarly introspection within extreme environmentalism that is of greatest concern here; there is demonstrably a double standard. An even greater concern is the almost cult-like religiosity within some parts of the environmental movement that is quick to identify and viciously attack heretics and infidels but averse to self-examination and self-criticism. This group, which rightly condemns the pressure on science from fundamentalist religious groups, is now acting in the same manner as those groups. Any other field of science with a history of as many extreme statements, personal attacks, and repeatedly wrong predictions, with so little self correction, would be given short shrift by the scientific community. But extreme environmentalism sails on, brazenly flying the colors of science and turning environmentalism into a morality play.

At least some environmentalists have not been honest with us, and have operated with the intent to alarm, instead of inform, the public. Sincere observers have been pointing this out for a long time, with Lomborg being only one of the newer members of the group. And such informed questioning will and must continue so long as reasonable people see unreason in the environmentalist ranks. Extreme environ-

mentalists have portrayed themselves as “scientists” pitted against “non-scientists.” Rather, the dichotomy is more visceral vs. cerebral, emotion vs. reason, and ideology vs. science. The real danger to the environment, in this context, is not only the estrangement of the thoughtful members of the scientific community, but also the potential estrangement of the general population that eventually must pay for environmental improvement.

ERODED CREDIBILITY For the environmental movement to retain credibility, its own members must themselves be willing to flag error and exaggeration in the ranks. But that often fails to happen. An egregious example, again from my environmental specialty, comes easily to mind. On February 24, 1995, David Pimentel et al. published in *Science* a long, alarmist paper on soil erosion that was uncritically received and reported within most environmental communities and has been extensively cited.

While Lomborg has been roundly condemned for writing outside his expertise, by the same token, Pimentel et al. are not authorities on soil or soil erosion. The late Pierre Crosson, an internationally known agricultural economist at Resources for the Future in Washington, D.C., and I, individually and together, questioned the findings of this report, maintaining that while some were arguable, others were clearly and demonstrably wrong (*Science*: July 28, 1995; Aug. 20, 1999; Nov. 19, 1999).

While Pimentel et al. claimed to use “data from field experiments of soil scientists,” some of the paper was hardly more than a collection of exaggerated and unverified claims. For example, Pimentel’s huge estimate for soil erosion in Europe of 17 tons per hectare per year had its origin as a range of 10–25 tons from a graduate student’s one small experimental plot in Belgium. But upon consideration, the student rejected the results as unreliable. Later, succeeding researchers, for whatever reasons, appropriated this number first for a region of Belgium, then for all of Belgium. Pimentel et al., apparently with no checking, then took the right-skewed range from a fifth-generation source, averaged the extreme values, and then applied the mean to the entire continent of Europe. This value, at least an order of magnitude too high, has since been used for various scientific purposes by many researchers who unsuspectingly accepted it at face value.

This example of misused and completely erroneous data in the soil science arena was reported in 1998, now nine years ago, by John Boardman, an internationally recognized authority on soil erosion at Oxford University. One has to wonder why such a bombshell revelation would not have created a sensation in the environmentalist community that so quickly accepted the fraudulent number in the first place. We have seen what happens when a critic of the movement supposedly makes such a mistake. By the same token, there should have been a reaction to the error in Pimentel et al. and there should have been a correction published by Pimentel, *Science*, or the AAAS, but none of those things ever happened. And no matter how discredited Pimentel’s views might be, he continues to be one of the appointed few for *Science*, having been recently selected to review a book concerning genetically modified foods in which he went

off on a tangent about the superiority of organic farming (Oct. 29, 2004). When Avery et al. severely critiqued this review (March 4, 2005), Pimentel used the opportunity to repeat his discredited story of a U.S. soil erosion crisis. As with Pimm, did anyone at *Science* not know what Pimentel would say? Donald Kennedy, editor-in-chief of *Science*, stated in *Commentary* (Dec. 2002) that *Science* attempts to avoid the “usual suspects” (scientist reviewers with a known viewpoint), but that editorial discretion is obviously not always exercised.

It is fair to wonder how often instances like the foregoing Pimentel example occur. I fear that it is too often.

Is it possible that scientific journals accept gloomy assessments of the environment based on lower standards of evidence, thus leading to more literature supporting that perception? Embedded in the 1995 Pimentel et al. *Science* paper was an unintended litmus test of the double standard in environmental science. Pimentel et al. claimed to have used their own soil erosion models that predicted some of the high soil losses they reported, but they did not include any description of those models nor did they include any references to them. Where was the rigorous refereeing and editing called for by Lomborg’s critics? Indeed, it is hard to escape the impression that the referees found that the message here was what they wanted to hear, so any means to the desired end was justified – valid evidence be damned. One can easily imagine what would have happened if the undisclosed models had shown very low erosion rates. As indicated in the beginning of this article, even 44 years of precise measurements were not adequate to convince at least one referee that soil erosion had declined significantly, and that referee’s unsubstantiated disagreement was enough to reject the paper.

BAD NEWS IS GOOD This situation is an example of what often faces environmental scientists with an upbeat message. The implication is that flimsy or even no evidence for environmental degradation is acceptable, but any evidence for improvement is suspect. For those of us in academe, all of this can have profound implications for careers that depend on having many (but not necessarily *good*) publications for advancement. And based on prima facie evidence, environmental extremism is good for the career.

It is also troubling that so much of the argument against the skeptics on environmental problems is the old ad hominem one: they are all in the pockets of the capitalist-industrialist-polluters. But I have rarely seen it suggested that any environmental pessimists might just be influenced by groupthink-careerism-environmentalist-ideologues. Most of my own uncertainty about the degree and causes of many environmental problems is driven by what I have seen in my own field: if the published work on other environmental problems is fraught with as much hyperbole, misinformation, and lack of expertise as I have encountered in the study of soil erosion, then we all have every right to be at least somewhat skeptical.

Of course, most published research on soil erosion is good science. But for some reason, it seems to be the gross exaggerations and/or misinterpretations of good data that often receive most attention. An example of the latter is useful periodic data

from the federal Department of Agriculture on U.S. soil erosion based on models. But the models predict only the soil moved, with soil actually being removed from fields being only a small fraction of the published figures. Unknowing alarmists like Pimentel et al. present the gross values as soil lost, as though all the eroded soil had been transported to the oceans. Such misconceptions are then repeated elsewhere, such as in the popular media and in textbooks. For example, Raven et al. (*Environment*, 2nd ed., Harcourt Brace) mistakenly inform college students that the USDA *measures* soil erosion and that 4.4 billion tons of agricultural soil are lost each year. This is merely uninformed nonsense but, unfortunately, it is the sort of information base that many people use to perceive the condition of the environment and make political decisions about it.

Another oft-repeated error is that soil erosion in the United States has increased over the past 50–70 years. Yet, every study of which I know using long-term field measurements of soil erosion indices indicates that both wind and water erosion have decreased

RECTIFICATION

David Schoenbrod's September 2002 *Commentary* essay "The Mau-Mauing of Bjorn Lomborg" brought a flurry of responses in the magazine's December 2002 issue. Among them was one from Donald Kennedy claiming *Science* innocent of being unfair to Lomborg. But Schoenbrod did not let him off so easily, first showing that *Science* had been unfair, then further maintaining that it should make amends. Such amends are important because scientists need to know they will not be trashed for unpopular findings. Not everyone has the moral courage of Simon, Lomborg, and Harrison, and it seems probable that some may "pull their punches" to avoid the sort of personal and professional abuse we have seen. But *Science* still has not made amends, and it has deliberately avoided at least two such opportunities to do so.

RESPONSE By late 2001, at least some of us in environmental science were disgusted with the overall treatment of Lomborg by the environmental science community as well as the

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greatly since the 1930s. But not many such studies appear in *Science* or *Nature*, perhaps for reasons we have already seen.

Most troubling to me is the perception that at least some scientists have abrogated their social contract with the public. Merely reporting the actual conditions of a problem seems to no longer be adequate — exaggeration and scare tactics must be used to elicit the desired political action.

The costs of environmental fear mongering are high. Fear is effective only in the short term and, ironically, is counterproductive in the long term because public attention and trust in the reliability of science are squandered (Von Storch and Stehr, *Der Spiegel*, Jan. 24, 2005).

Many environmental scientists welcome the fresh air of reason, skepticism, and true "critical thinking." Examples of such critical thinking are recent works of scientists like Stocking, Fairhead, Stott, and others who have debunked the highly exaggerated estimates of deforestation and soil erosion in Africa. And one might consider the fine work of Brüggemeier who has shown that the hugely ballyhooed phenomenon of *Waldsterben* ("Forest Death") in Europe was primarily a delusion from environmental hysteria. He properly asks why so many took up the cry of disaster and yet few admitted the hoax, even when revealed. The public should know that there are many environmental scientists, hopefully most, who are not ideological or career driven and who do their best to do objective and useful work. But a major problem is that without the acceptable ideological stance, their chances of getting their work published in the best journals are reduced.

unscholarly mindset and institutionalized bias that had led to it. The late Pierre Crosson and I decided to confront the environmental establishment by putting together a short essay that embodied many of the salient points made in this article, with the intention of publishing it in *Science*. Our reasoning was that because so much of the abuse had appeared in *Science* and *Nature*, one of those should be the forum in which it would be addressed. Besides, a good academic publication would value a serious, thoughtful response.

Before submitting, we sent the essay out for vetting to a group of about 40 environmental scientists and writers in the United States, Canada, the United Kingdom, and Israel, most of them of international stature. The names were those mostly in our computer address book, but they included five U.S. National Academicians, and we also sought out such people as Stephen Budiansky, former Washington editor for *Nature*. We requested those people to review our essay carefully, making sure the facts were correct and the language was as dispassionate and clinical as possible, and we asked for any improvements in content or phrasing. While nearly all of our respondents warmly endorsed our essay, we did not use their approval as a basis for acceptance.

By the time we received and integrated all the responses, it was June 2002 and we then submitted it to *Science*. Within a week or so, *Science* curtly informed us that the Lomborg affair was no longer of interest and thus neither was our essay. We then requested that they at least send it out for review, and that we would accept the verdict. Again, a refusal. We then sent it

to *Nature*, with the same response.

Then, in early 2003, the Danish committee verdict accusing Lomborg of “dishonesty” came in. With all the press coverage (including both *Science* and *Nature*), the Lomborg controversy was clearly in the news again, so the ostensible block from *Science* was removed. We modified the essay to reflect the new developments, including Raven’s and Pimm’s infamous comments, and resubmitted it to *Science*. Again, a summary rejection. Neither journal has made amends, to my knowledge.

CONCLUSION

As this goes to press in the spring of 2007, it is clear that little has changed. The ideological gatekeepers still exert undo influence.

If we learned nothing else from authoritarian regimes of the past, it is that ideology and science do not mix. Group-

think, emotionalism, ad hominem attacks, and suppression of dissent are unthinkable in both a free society and certainly in a productive scientific atmosphere.

We must insist that exaggeration or distortion of scientific findings to support public opinion or a policy position is always illegitimate. Accurately reported scientific findings have a key role to play in support of public policies for the most sensible decisions about how to deal with society’s problems. Good science is the source of that knowledge.

Advocacy for particular policies that is based on good science is always legitimate. But advocacy based on twisted science and intimidation not only discredits the scientists who practice it and the scientific community in general, but more importantly it risks significant diversion of public resources from the resolution of real problems. **R**

Readings

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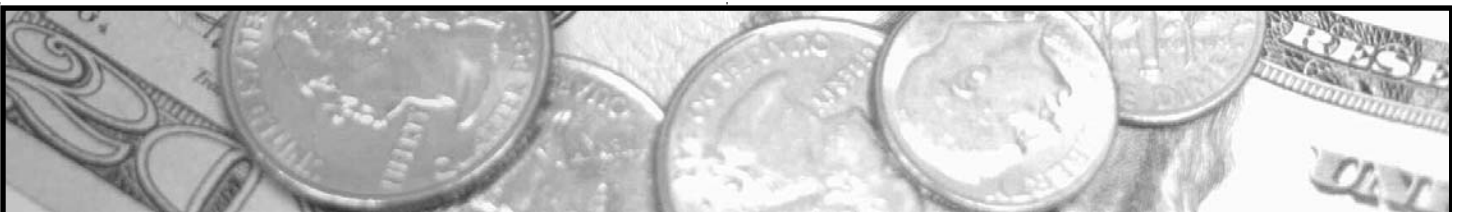
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