

EDUC 357 Science & Environmental Education in Informal Contexts

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Literature Reaction Paper

Merchants of Doubt

In a democratic society, citizens are involved in government decision making. And in a scientific society, government decision making involves scientific evidence. Thus, the public's understanding of science is a necessary feature of proper governing. This produces a catch-22 for scientific phenomena like global warming which are exceedingly complex, because it is unreasonable to expect every citizen to fully understand the evidence for any given topic. Indeed, it takes decades for an entire community of full-time scientists to arrive at even a small kernel of truth.

In *Merchants of Doubt*, Naomi Oreskes and Erik M. Conway recount several stories around the theme of "false doubt," i.e. scientific truths which are not, but should be, accepted as true. The focus of Chapter 6 is the denial of global warming, but the book also investigates the science behind nuclear winter, acid rain, the ozone hole, second hand smoke, and DDT. In each case, Oreskes and Conway claim, the science has been established as matter of fact, and a team of politically and financially motivated conservative bad guys attempt to sabotage those truths. The disputes about what constitutes good science, reliable evidence, and the meaning of "reasonable doubt" are left swirling in a media atmosphere with a greenhouse gas of its own: polarization.

The global warming debate revolves around a series of claims:

- 1) Human activity, particularly the burning of fossil fuels, is increasing the concentration of carbon dioxide in the atmosphere
- 2) Increasing the concentration of carbon dioxide will increase the overall temperature of the earth
- 3) Increasing the temperature of the earth will have negative consequences for human civilization
- 4) Action should be taken to reduce the amount of carbon dioxide being added to (or currently in) the atmosphere

The science behind each of these claims is exceedingly complex, more so as you go up in numbers. As Oreskes and Conway walk through the various attacks launched by the bad guys on the science of global warming, it's important to recognize *which* claim or claims are being attacked. The bad guys involved in the 1983 *Changing Climate: Report of the Carbon Dioxide Assessment Committee*—Nordhaus, Schelling, and Nierenberg—all accepted claim #1: "...that anthropogenic carbon dioxide emissions have been rising steadily, primarily driven by the combustion of fossil fuels" (178). They sort of accepted claims #2 and #3 as well, although they downplayed the extent of the temperature increase and potential human consequences. They only outright rejected claim #4—action should be taken:

A significant reduction in the concentration of CO₂ will require very stringent policies, such as hefty taxes on fossil fuels ... The strategies suggested later [in the report] by Schelling—climate modification or simply adaptation to a high CO₂ and high temperature world—are likely to be more economical ways of adjusting ... Whether the imponderable side effects on society—on

coastlines and agriculture, on life in high latitudes, on human health, and simply the unforeseen—will in the end prove more costly than a stringent abatement of greenhouse gases, we do not now know. (179)

Oreskes and Conway frame this argument as a denial of scientific facts, calling it wholly unreasonable: “It was equivalent to arguing that medical researchers shouldn’t try to cure cancer, because that would be too expensive, and in any case people in the future might decide that dying from cancer is not so bad” (179). This is a little unfair. Nordhaus here makes global warming out to be more like the common cold than cancer. There are myriad over-the-counter treatments for the symptoms of the common cold, but little effort is made to attack the cause, mainly because there are so many viruses associated with it that trying to vaccinate against it would probably be a waste of time and money, and likely cause more harm than good. If the effects of global warming on human civilization are mild, as the bad guys here claim, then adaptation may well be the better route.

This is a perfect example of the difference between—and blending of—facts and values. The bad guys here do not dispute the fact that global warming is happening, or caused by humans; they just downplay its effects and consequences, and arrive at a different decision around what to do. And when there are a range of outcomes around how much, how quickly, and how damaging global warming will be, it’s really hard to pin down whether “downplaying” effects and consequences is really a rejection of scientific “fact.” However, as Oreskes and Conway point out, it is clear that the 1983 report did downplay the effects, and also included some holes in logic. One of the most blatant instances: in attempting to downplay the consequences of sea level rise, Nierenberg claimed that people could simply migrate to higher ground. While this is true, it would undoubtedly be a devastating process involving widespread human suffering (not to mention economic costs).

The original attacks on global warming science focused mostly on claim #4, while downplaying claim #3, and to a certain extent claim #2. The baffling part of the global warming controversy is that today, more than 3 decades later, we seem to have gone backwards and are somehow still debating claims 1 and 2. The counter-claims to these points predominantly rely on bad science: cherry picking and motivated reasoning.

To me, the backpedaling of the debate from “what to do” to “is it happening” reflects its entrance into the public sphere, and the black-and-white nature of scientific understanding that predominates politics and the media. Either global warming is happening, or it isn’t. From an activist standpoint, these positions make sense. It’s easier to get a bill passed if everything is lumped together in a neat little ball of cause and effect: burning fossil fuels causes global warming, global warming will be devastating for all of mankind, therefore government should impose a heavy tax on fossil fuels. Or, on the flip side, instead of arguing that free market economies thrive in the absence of government oversight, and the benefits of a thriving economy outweigh the costs of sea level rise, desertification, extreme weather events and other consequences of global warming, republicans have found a more efficient way to arrive at the same conclusion: just deny that the phenomenon is occurring in the first place.

Even though the other chapters in the book were not assigned, I want to mention them briefly because the examples are fascinating. The first chapter talks about smoking and cancer, which has now been

established as an irrefutable and strong cause and effect link. Chapter 5 is about the link between *second-hand smoke* and cancer. As you can imagine, this is a more difficult link to pull out of scientific data. The second chapter talks about the scientific debate around nuclear winter. Basically, Reagan wanted to enter an arms race with the Soviet Union, building more nuclear missiles as well as a missile defense system. The debate entered a morbidly amusing level of specificity: if there were nuclear war, dust and debris would scorch the skies, causing the temperature to drop, i.e. “nuclear winter.” The argument against the arms race somehow rested on how cold the earth would get, if there were a nuclear war.

To what extent are any of these debates actually about science? When it comes to nuclear war, I think it’s ridiculous to claim that this was a scientific debate. It doesn’t matter how cold the earth will get in the event of nuclear war—it would be a terrible thing either way. The science behind nuclear winter is of practically no consequence. Second-hand smoke is a similar, albeit lower-stakes, example. Maybe second-hand smoke slightly increases cancer risk, depending on level of exposure, and maybe it doesn’t. But again, *it doesn’t matter*. If enough non-smokers simply don’t like the smell, or the sensation of breathing it, then smoking should be restricted either way. On top of that, marketing addictive substances adds an entirely different moral (and scientific) factor, which in my view supersedes the cancer-causing potential of second-hand smoke. These are examples of policy decisions that don’t necessarily need the science to begin with. Or at least, they don’t rest on it.

Discussion Questions:

- *How is the role of science different in the global warming debate compared to second-hand smoke and nuclear winter?*
- *Are trust and skepticism mutually exclusive?*
- *Is Scott Pruitt a global warming denier? What does “global warming denial” mean?*
- *If you had to convince an open-minded global warming skeptic of your view, what evidence would you point to?*
- *Which claims in the global warming debate are scientific, which are not? Which are somewhere inbetween?*
- *Is it possible to accept that global warming is happening and still oppose a carbon tax?*