



## Book Merchants of Doubt

### How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming

Naomi Oreskes and Erik M. Conway  
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## Recommendation

“As recently as 2007, 40% of Americans believed that scientific experts were still arguing about the realities of global warming.” And, of course, they were not; global warming is a long-acknowledged, scientific fact, say science professor Naomi Oreskes and science writer Erik M. Conway. They present their case that “merchants of doubt” – a dedicated cabal of conservative scientists on the payrolls of industries and right-wing think tanks – have labored successfully over the decades to convince a broad spectrum of the public that the truth is not true, that scientific fact is merely opinion, that secondhand smoke will not kill you, that industrial pollution did not cause acid rain, that chlorofluorocarbons (CFCs) did not deplete the ozone layer and that global warming does not exist. In this jaw-dropping, meticulously researched work of science, politics and investigative journalism, Oreskes and Conway track the shockingly long history of widespread, willful dissemination of scientific fiction in the service of politics and profits. *BooksInShort* recommends this sure-to-be classic to all those interested in the environment, in the processes of politics, science and media, and in learning the hard facts that underlie so much propaganda.

## Take-Aways

- For decades, a group of scientists has worked aggressively to subvert scientific fact.
- Physicists Robert Jastrow, Frederick Seitz and S. Fred Singer, among other scientists, fought the truth to serve their conservative agendas and corporate clients.
- They promoted doubt regarding the dangers of tobacco, acid rain, ozone depletion and global warming
- These contrarians did little research, and the facts uniformly disproved their stances.
- Industrial interests and political organizations underwrote their sophisticated disinformation campaigns
- The news media came to treat these campaigns as genuine scientific debate.
- By repeatedly asserting bogus claims, these scientists sought to undermine public faith in all science.
- When the Berlin Wall fell and the USSR collapsed, archconservatives found a new enemy – environmentalists.
- Their prime strategic directive was the politicization of objective scientific findings.
- The fight against the truth of global warming has been surprisingly effective.

## Summary

### “The Merchants of Doubt”

During the Cold War, “extremely hawkish” physicists Frederick Seitz and S. Fred Singer feared the Soviet Union and became prominent backers of Ronald Reagan’s

“Star Wars” missile defense system. Their outspoken politics brought them into a network of right-wing think tanks, institutions, corporations and political figures. Between 1979 and 1985, Seitz worked for R. J. Reynolds Tobacco Company, which provided \$45 million for “biomedical research that could generate evidence...to be used in court” against those suing big tobacco. After decades of tobacco advocacy, Singer cowrote a significant attack on the Environmental Protection Agency’s position on the hazards of secondhand smoke. Claiming it was harmless, he said those who sought to limit people’s exposure to it just wanted an excuse to impose government regulation. A conservative think tank gave the Tobacco Institute funding for Singer’s report.

“A small group of men with scientific bona fides and deep political connections deliberately distorted public debate, running effective campaigns to mislead the public and deny well-established scientific knowledge over four decades.”

Later, Seitz and astrophysicist Robert Jastrow tried to deny global warming in a report that got them invited to George H. W. Bush’s White House. *The New York Times*, *The Washington Post*, *Newsweek* and other media covered the report as if it offered another serious view in the “scientific” discourse. Yet, in two decades, “these men did almost no original scientific research on any of the issues” they covered publicly, launching attacks on other scientists’ findings and “reputations.” Actually, “on every issue, they were on the wrong side of scientific consensus.”

## Smoke and Secondhand Smoke

When Seitz and his colleagues James A. Shannon and Maclyn McCarthy contracted with R. J. Reynolds, their task was “to fight science with science.” The tobacco industry needed data to resist smokers’ lawsuits and forestall antismoking legislation. Seitz and others provided it. As early as 1953, *Reader’s Digest*, then the world’s most popular magazine, ran “Cancer by the Carton,” exposing the link between smoking and cancer. In response, the leaders of five giant tobacco firms formulated a coordinated public relations policy to defend their industry, even though big tobacco’s own research clearly linked cancer and smoking, and – by the 1960s – confirmed the addictiveness of nicotine.

“A key strategy...was to create the appearance that the claims being promoted were scientific.”

Behind closed doors, “the tobacco industry knew the dangers of smoking.” But Seitz and his colleagues fought every new release of data that confirmed what the industry already knew. By the mid-1980s, tobacco had spent more than \$100 million on biomedical research. Then their scientists distorted their findings to try to blunt the rapidly emerging truth. As federal authorities found the tobacco giants guilty of breaking racketeering laws and conspiring to conceal what they knew, Seitz moved along, becoming the founding chairman of the George C. Marshall Institute, a conservative think tank promoting “science for better public policy.”

## Strategic Defense

The right-wing think tanks that agreed with Seitz’s devout anticommunism included the Hoover Institution, the Hudson Institution and the Heritage Foundation. During the 1970s, these groups and their congressional allies wrecked the notion of a peaceful détente with Russia. They backed an arms race and sought heavy government spending on weapons. While Seitz, Jastrow and Edward Teller (the “father of the hydrogen bomb”) argued for a nuclear defense system, astronomer Carl Sagan famously declared that any atomic weapons battle would lock Earth in a “nuclear winter.” Sagan had wide credibility and a large public platform.

“Fred Singer, Fred Seitz and a handful of other scientists joined forces with think tanks and private corporations to challenge scientific evidence.”

Department of Defense and CIA assessments of Soviet military strength in the late 1970s cast the USSR as far weaker than the US. Teller and his compatriots disagreed. Seeking an alternative view, they created a coalition of noted anti-Soviet hawks and called it “Team B.” They “cast the Soviet effort in the most alarming possible light.” When Reagan was elected, he promoted the Star Wars defense system of offensive and defensive nuclear weapons orbiting the Earth. Sagan joined many others in opposing Star Wars, debunking its false science and its underlying propaganda. He and his colleagues produced a report on everything untenable about Star Wars.

“Seitz and his colleagues would fight the facts and merchandise doubt all the way.”

Under the Marshall Institute’s auspices, Jastrow vowed to fight these opponents. With others, he launched personal attacks against Sagan, and far-fetched but well-presented assaults on the legitimate science in Sagan’s report. The attacks sought to confuse people about both positions. The Jastrow side understood that neither the public nor Congress knew enough science to make a choice based on the merits of scientific arguments. When Jastrow’s legitimately credentialed scientists loudly presented “phony science,” they set a model for their future ideological attacks.

## Acid Rain

“For decades, preservationist environmentalism remained bipartisan.” President Richard Nixon, a Republican, established the Environmental Protection Agency and signed the Clean Air Act, the Clean Water Act and the Endangered Species Act. Such bipartisanship was about to change. Take what happened with acid rain, a phenomenon that scientists in New Hampshire identified in 1963, and that scientists worldwide documented and studied over the following decade.

“Why did they continue to repeat charges long after they had been shown to be unfounded? The answer, of course, is that they were not interested in finding facts. They were interested in fighting them.”

In the early 1980s, a Reagan administration scientific panel found that most of acid rain’s acidity was “due to dissolved sulfate and the rest mostly to dissolved nitrate, by-products of burning coal and oil.” The administration rejected that panel’s findings as well as the National Academy of Sciences’ 1981 conclusion that the US should reduce industrial pollution by 50%. Reagan turned to Star Wars defender William (Bill) Nierenberg, who “hated environmentalists,” to chair the administration’s “own panel of experts,” which met in 1983. Details about acid rain’s long-term, irreversible damage appeared in the panel’s earliest reports but not in later versions.

“The Internet has created an information hall of mirrors, where any claim, no matter how ludicrous, can be multiplied indefinitely.”

Singer, a White House appointee to the panel, built ambivalence into the very process by which experts drew conclusions. In his appendix to the public report on the

panel's findings, Singer asked if reducing emissions would cut acid rain's environmental impact. "In posing the question, he left the reader with the impression that the answer was, perhaps, no." Over a few months, Singer and Nierenberg delayed and altered the report – "without the agreement of the full panel" – in a way that undercut its depiction of acid rain's impact. Their strategy was clear: politicize scientific material. The lack of acid rain legislation in Reagan's term was their victory. The White House took the stance that the government didn't know what caused acid rain or how it originated, thus mirroring the tobacco industry's decades-long position on smoking and cancer.

"Since no one knew the mechanism that started the hole [in the ozone layer], no one would be certain that it would not grow."

The media echoed the "doubters'" relentless espousal of confusion as if that fit the facts, which it did not. In 2007, the Marshall Institute still claimed that acid rain destruction was "largely hypothetical." The strategy of "sowing doubt" is astonishingly successful. In the future, doubters will not just "tamper with the peer review process," they will "reject the science itself."

## The Ozone Hole

"The idea that human activities might be damaging the Earth's protective ozone layer first entered the public mind in 1970." Chemicals called chlorofluorocarbons (CFCs) were at the root of the damage. If the ozone layer became depleted, humans would have less protection against ultraviolet radiation, proven to cause skin cancer. At the time, manufacturers produced "billions of pounds of CFCs...every year for use in spray cans, air conditioners and refrigerators."

"The expedition provided the 'smoking gun' by showing a strong correlation between high chlorine levels and low ozone levels."

The aerosol industry instantly counterattacked scientific claims that CFCs caused ozone damage. Industry groups dispensed millions for research grants, seeking to disprove any connection between CFCs and global warming. A government panel recommended banning all CFC emissions immediately, but it shifted the weight of enacting its conclusion to the Academy of Science, where the "leadership was not pleased to be stuck with the job of deciding whether or not to extinguish the \$1 billion per year CFC spray industry." The CFC lobby fought hard, but the fervent race to enact regulation surprised the industry, as did the grassroots response: Consumers were voluntarily abandoning CFC products. "In 1977, CFC propellant use had already dropped by three-quarters." The 1979 ban on CFCs only codified what was already in practice.

"The protocol was revised to include a complete ban on the manufacture of chlorofluorocarbons."

In 1985, the British Antarctica Survey announced the discovery of a huge, worrying ozone hole over Antarctica. Scientific deniers made much of the fact that NASA's orbiting satellite found no such hole. Further study showed that Antarctic ozone levels were so extraordinarily low that the satellite's detection software mistook actual conditions for a glitch in its own processing, and so rejected the data. Later studies confirmed the hole, leading to even more stringent bans on CFCs. So "if environmental regulation should be based on science, then ozone is a success story."

"Meanwhile, something very interesting had happened: American people had already started to change their habits."

But, as before, conservative and radical free-market think tanks opposed any limit on profit-making substances and denied scientific facts. Even after CFC regulation, the doubters pushed their position: You cannot trust science, and a counternarrative always exists, no matter how fantastic. One counternarrative cast ozone depletion as the "extremist" scientific community's conspiracy to acquire more funding for unneeded research. Singer spoke for this theory, and his first shot was a front-page article on "the ozone scare" in *The Wall Street Journal*. He had three propositions: "The science is incomplete and uncertain; replacing CFCs will be difficult, dangerous and expensive; and the scientific community is corrupt and motivated by self-interest and political ideology." Singer flogged these ideas despite the hypocrisy of suggesting that others acted as he did.

"Nearly every American knew that smoking caused cancer, but still tobacco industry executives successfully promoted and sustained doubt."

Singer established a nonprofit to push these views, and soon he had a powerful ally: Dixy Lee Ray – former governor of Washington state, former "zoologist and head of the Atomic Energy Commission" – proved a strident, media-friendly advocate. She listed the ozone hole, among other issues, as "'scares' promoted by environmentalists." She seemed credible, having written a 1993 book called *Environmental Overkill*. Between 1988 and 1995, Singer continued to say ozone research was wrongheaded and motivated by greed.

## Global Warming

Bill Nierenberg headed the Carbon Dioxide Assessment Committee at the National Academy of Science. Unable to agree on a conclusion, the committee produced separate chapters, authored and signed by individuals. The chapters written by the natural scientists were straightforward: "No one challenged the basic claim that warming would occur with serious physical and biological ramifications." Nierenberg's allies offered a number of concocted hypotheses regarding the cause and, they claimed, short-term duration of any warming. A peer reviewer of the report, Alvin Weinberg, a physicist in charge of the Oak Ridge National Lab, found it "seriously flawed in its underlying analysis and in its conclusions." That happened because certain members of the reporting panel hoped to create precisely such an impression. "The devil was not in the details. It was the main story. CO2 was a greenhouse gas. It trapped heat. So if you increased CO2, the Earth would warm up."

"No one challenged the basic claim that warming would occur with serious physical and biological ramifications."

In 1989, the Berlin Wall fell and the USSR's reign ended. Institutions like the Marshall Institute, where Nierenberg was on the board, turned their attention from Russia to environmentalism. The Marshall Institute released a contrarian's report claiming that most atmospheric warming had taken place prior to 1940; thus, warming was not a product of increased industrialization and emissions. "Jastrow, Nierenberg and Seitz had cherry-picked the data," choosing only the facts that suited their argument. The three continued to attack all reports and commissions that studied the topic. Seitz used *The New Republic* and *The Wall Street Journal* as his primary vehicles. When more knowledgeable, less politicized experts wrote to the *Journal* asking to have their opposing view published, it edited their statements in ways that weakened their arguments. George H. W. Bush's White House and the *Journal* continued to give credibility to the Marshall Institute's contentions and, because they did, so did millions of citizens.

# About the Authors

University of San Diego history and science studies professor **Naomi Oreskes** wrote “Beyond the Ivory Tower,” a global warming study in *Science*. **Erik M. Conway** has written four books, among them *Atmospheric Science at NASA: A History*.

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