



MERCHANTS OF DOUBT

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

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General Overview:

Science can rarely ever draw definitive conclusions early on but usually must wait until empirical proof emerges before theories can be validated. A handful of politically conservative scientists (with strong and often undisclosed ties to particular industries) have used this characteristic of the scientific method to their advantage to challenge the scientific community's emerging consensus on various issues including the health dangers of cigarette smoking, the effects and source of acid rain, the existence of the ozone hole and in more recent times the impact of man's activities in generating climate change.

What's interesting about this phenomena is the same group of three scientists – physicists Bill Nierenberg, Fred Seitz and Fred Singer – keep popping up again and again whenever science is attempting to form a consensus view on controversial political issues like global warming. It appears their standard modus operandi is to use the scientific community's insistence on gathering definitive empirical data first as an opening to generate deliberate obfuscation about these issues, thereby influencing both public opinion and the political will of policy makers. In other words, today's climate change skeptics are in fact recycled critics of controls on tobacco and acid rain who use their scientific credentials to present themselves as authorities and then attempt to steer the public debate to try and discredit any science they don't like.

The best way to respond to their attempts to discredit science, disseminate false information, spread confusion and create doubt is to be aware of what's going on.

*** Please Note:** This political book summary does *not* offer judgment or opinion on the book's contents. The ideas, viewpoints and arguments are presented just as the book's *author* had intended.

The Big Six

The six most high profile scientific issues which have dominated public policy debates and also politics in the late twentieth and early twenty-first centuries have been:

1. *The Link Between Tobacco and Cancer* – whether or not this could be scientifically established
2. *Star Wars* – the space-based Strategic Defense Initiative and the science of nuclear winters
3. *Acid Rain* – sulphur and nitrogen emissions mixing with rain to become highly corrosive
4. *The Ozone Hole* – the idea that human activities were reducing the Earth’s protective ozone layer
5. *The Effects of Secondhand Smoke* – whether it caused cancer in otherwise healthy nonsmokers
6. *Global Warming* – whether it is being caused by CO₂ emissions released by burning fossil fuels

As diverse as these topics may sound at first glance, every time they have been discussed in public forums, there has been a small band of scientists who have been hard at work behind the scenes throwing doubt on the work of the scientific community. The backroom operatives who have played a disproportionately large roles in public debates about all six of these issues are:

- *Bill Neirenborg* – a physicist who worked on the Manhattan Project which developed the atomic bomb during World War II. He was at one time a director of the Scripps Institution of Oceanography and served as a member of Ronald Reagan’s transition team where he nominated scientists who should serve in important positions in the incoming Reagan administration. He was a co-founder of the George C. Marshall Institute in 1984 and served for many years as a consultant to the National Security Agency of the United States. He also served as a consultant to the White House Office of Science and Technology and as a member of the NASA Advisory Council from 1978 until 1982.
- *Fred Seitz* – a solid-state physicist who also helped develop the atomic bomb. He is a former president of the U.S. National Academy of Sciences. Fred Seitz and Fred Singer have collaborated together to oppose many forms of state intervention and regulation of U.S. citizens. Seitz and Singer formed the Heritage Foundation, the Competitive Enterprise Institute and the Marshall Institute to carry out their battles against what they considered to be “bad science.” Fred Seitz had a very distinguished career: he served as a science advisor to NATO in the 1950s, as president of the National Academy of the Sciences in the 1960s and as president of Rockefeller University (America’s leading biomedical research institution) in the 1970s. Seitz was ardently and passionately anti-communist and viewed the scientific community as being sometimes “fickle and even irrational.” At the same time, he also believed “technology is continuously devising procedures to protect our health and safety and the natural beauty and resources of our world.” Seitz also believed it would be possible to achieve American political superiority through superior weaponry and a strong military. Fred Seitz passed away in 2008 at age 96.
- *Fred Singer* – an Austrian-born physicist and a genuine rocket scientist. Fred Singer was a leading figure in the development of Earth observation satellites and served as the first director of the National Weather Satellite Service. He also served as chief scientist at the Department of Transportation during the Reagan administration. Dr. Singer is emeritus professor of environmental science at the University of Virginia and has been an outspoken critic of the mainstream assessment of global warming. In 1990, he formed the Science & Environmental Policy Project to advocate the fact there is no evidence that global warming is attributable to human-caused increases in atmospheric carbon dioxide, and that humanity would benefit if temperatures do rise.

The way these three scientists have acted to try and throw doubt on the science underpinning public debate on all of the Big Six issues has followed the same pattern which they originally used to discredit scientific research which linked tobacco to cancer. Their basic modus operandi or “Tobacco Strategy” is:

1. Use scientists – with guidance from industry lawyers and public relations experts – to target the research and findings of other scientists and undermine their findings.
2. Put into the public domain alternative scientific explanations for what was being observed. (For example, acid rain could be caused by volcanoes rather than man’s activities or global warming is just part of natural cyclic variations in the sun’s activities.) The existence of other alternative explanations would then cause the general perception the scientific community was still trying to establish exact cause-and-effect relationships for what was being observed.
3. Make full use of the fact those who were expressing doubts over the science involved were well-known and highly respected in Washington D.C. and therefore should be taken seriously rather than dismissed as part of the scientific community’s lunatic fringe.
4. Use the mass media to create the perception there are two “sides” to every scientific debate and that the findings of the research program are still being actively debated by the scientists involved rather than accepted as fact by all and sundry.

The way the Tobacco Strategy has been applied to the Big Six issues is highly illuminating:

Tobacco Causes Cancer

In 1953, the presidents of four of the largest tobacco companies as well as the CEOs of R.J. Reynolds and Brown and Williamson had created a Tobacco Industry Research Committee specifically to challenge the mounting scientific evidence of the harms of tobacco. This committee funded alternative research, cherry picked data which seemed to go against the consensus view and did everything feasible to, in the words of its public relations firm Hill and Knowlton, create the impression that “scientific doubts remain.” Yet despite the Tobacco Industry Research Committee’s best efforts, in 1959 the American Cancer Society issued a formal statement declaring that “cigarette smoking is the major causative factor of lung cancer.” The Royal College of Physicians agreed and in 1964, the Surgeon General of the United States issued a report which definitively concluded tobacco smoking caused lung cancer.

The tobacco industry responded with: “There is no scientific evidence that cigarette smoking causes lung cancer and other disease.” Congress didn’t ban or even limit sales of tobacco at that stage but did mandate that warning labels should be attached to cigarettes sold in the country in the future. The number of smokers declined from 37 percent of the adult population in 1969 to 33 percent in 1979, but industry profits soared. In 1969 alone, R.J. Reynolds had net revenues of \$2.25 billion – which explains why the tobacco industry was able to pour \$100 million into its research committee between 1953 and the mid-1980s. In 1981 alone, the Tobacco Industry Research Committee gave \$6.3 million in grants to 640 studies run by 250 medical schools, hospitals and research institutions. By comparison, the American Cancer Society and the American Lung Association spent a combined total of just under \$300,000 on research that same year.

By the late 1970s, a large number of lawsuits had been filed claiming personal injury damages from the tobacco industry. The industry’s standard defense was to show in court that research was then focused on other causes of the chronic degenerative diseases which were attributed to cigarettes. This legal defense had been successful to date, even though the tobacco industry had known about the potential for a link between cancer and tobacco since the 1950s. (It had been shown in 1953, for example, cigarette tar painted on the skin of mice caused fatal cancers. German scientists had also shown in the 1930s cigarette smoking caused cancer

but this work had become tainted because of its Nazi associations.) The problem was by the 1970s, there was starting to be more and more evidence tobacco did in fact kill people.

In 1979, Fred Seitz retired from Rockefeller University to run a biomedical research program which would focus on understanding the four leading causes of death in the United States – cancer, heart disease, emphysema and diabetes. This six-year long program was funded by a \$45 million grant from R.J. Reynolds. Seitz’s role was to choose which projects to fund, to monitor the research being carried out and then to report progress to R.J. Reynolds. The principal aim of the program, according to internal company documents, was to develop “an extensive body of scientifically, well-grounded data which would then be useful in defending the industry against attacks.” (In 1978 alone, smokers paid more than \$1.5 billion in cigarette excise tax in response to scientific evidence of smoking’s harms so this was a major issue for R.J. Reynolds and the other tobacco companies.)

The success of all that expenditure was impressive. It would not be until 2006 that U.S. District court judge Gladys Kessler would find that the tobacco industry had “devised and executed a scheme to defraud consumers and potential consumers” about the hazards of cigarettes. This followed a 2004 landmark federal case *U.S. vs. Phillip Morris et al* which had found the tobacco industry to be guilty under the RICO (Racketeer Influenced and Corrupt Organizations) Act. It had taken fifty years to reach the point at which the tobacco companies were forced to disclose publicly that their internal company documents proved they had known about the links between smoking and lung cancer since the 1950s.

Again, the Tobacco Strategy was:

1. Use scientists to dispute the findings of other scientists.
2. Promote alternative scientific explanations for what was being observed.
3. Use the fact the doubters were influential and well connected politically.
4. Create the impression there were two sides to every scientific study.

Star Wars – Applying the Tobacco Strategy to the Strategic Defense Initiative

When Ronald Reagan unveiled his Strategic Defense Initiative (“Star Wars” to most of us), numerous scientists stated the idea that the United States could “win” a nuclear war was impractical and destabilizing. This spurred Seitz into action. He joined forces with several old cold war warriors who were also physicists and passionate anti-Communists to form the George C. Marshall Institute. The Institute’s mission was ostensibly to “promote science for better public policy” but with Fred Seitz as the founding chairman of the board the Institute’s real aim was to again apply the Tobacco Strategy to help move SDI forward.

In 1976, new Central Intelligence Agency director George H.W. Bush called for independent analysis of Soviet nuclear capabilities and intentions. That analysis would ultimately be taken over by hawks who would conclude the “Soviet Union is preparing for Third World War as if it was unavoidable” and that Soviet leaders were outspending the West by a large margin. Edward Teller, a member of the President’s Foreign Intelligence Advisory Board, headed up a team of ardent anti-communists who served on these independent committees and who later came to be termed “Team B.” When President Reagan in March 1983 called upon the scientific community to turn their talents to give the nation means of rendering the Soviet’s nuclear weapons as impotent and obsolete by installing weapons in space which would destroy incoming ballistic missiles, Fred Seitz and other Team B members were ready to act. In response to the scientific community’s public opposition to SDI, Teller, Seitz and others formed the George C. Marshall Institute – so-named for the American architect of European reconstruction after World War II which was designed to head off the spread of communism throughout Europe. Scientists Robert Jastrow and William Nierenberg were also closely involved in the formation of the George C. Marshall Institute.

The Marshall Institute wasted no time in attacking any opponents of SDI as using “flawed science.” They hinted scientists who opposed SDI were aligned with liberal and environmentalist organizations. Seitz railed publicly about the lack of scientific integrity on the part of those opposing SDI without feeling any need whatsoever to mention the Marshall Institute’s own strongly held political views. The suggestion the scientific community was corrupted by left-wing politics and political bias was widely reported on. Teller and Seitz believed permanent U.S. military superiority could be achieved through better weapons engineering. When the influential Carl Sagan spoke of pending nuclear winters, Seitz and his colleagues promoted the views of economist Milton Friedman that capitalism and freedom go hand in hand and that there could be no freedom without capitalism and no capitalism without freedom. The end result of all the efforts of the Marshall Institute was they managed to turn the right wing of society against science.

Acid Rain and the Ozone Hole – Applying the Tobacco Strategy in New Contexts

Acid Rain entered the public debate at much the same time as the debate over strategic defense and the nuclear winter was reaching a crescendo. The science of acid rain was quite different to that of a nuclear winter and yet the people who vigorously opposed the underlying science were the same cast of characters as before – Fred Seitz, Fred Singer and Bill Neirenberg. Acid rain (which in a worst case scenario has a pH of 2.85 which is about the same as lemon juice) occurs when sulphur and nitrogen emissions generated by burning coal and oil mix with atmospheric moisture. The introduction of tall smokestacks with particle removers in the 1970s had the unintended consequence of increasing the occurrence of acid rain. Responding to growing political pressure to do something about acid rain, the White House Office of Science and Technology Policy commissioned a panel to review the evidence on acid rain in 1982. Bill Neirenberg was appointed chairman of the panel and he was able to hand pick the rest of the panel except for Fred Singer who was included at the insistence of the White House. When the Acid Rain Review Panel prepared its report, everyone was pretty much in agreement about the seriousness of the problem except for Fred Singer who wanted the report rewritten to suggest the science was not well known and that man-made solutions were not in fact required. This caused a lot of anguish behind the scenes for the panel members and when it was finally released in the summer of 1984, Bill Neirenberg was at pains to summarize it as: “Even in the absence of precise scientific knowledge, you just know in your heart that you can’t throw 25 million tons a year of sulphates into the Northeast and not expect some consequences.” Despite that assertion, the Reagan administration proposed no legislation during its term which addressed the cause of acid rain and it would not be until the incoming administration of George H.W. Bush in 1990 that amendments to the Clean Air Act would establish a cap and trade system to control acid rain. That ultimately led to a 54 percent decline in sulphur dioxide levels from 1990 to 2007 and economic benefits estimated at between \$101 billion and \$119 billion.

While the science of acid rain was in the process of being politicized, scientists also started focusing on a potentially more worrisome problem: the ozone hole. This was first studied when supersonic transports were proposed and the atmospheric impact of the new space shuttle was being calculated. However, the ozone layer really came into focus when the British journal *Science* published an article which pointed out common industrial chemical – chlorofluorocarbons (CFCs) – were releasing large quantities of chlorine monoxide into the stratosphere depleting the earth’s ozone layer. CFCs were at that time widely used in spray cans, air-conditioners and refrigerators. As scientists attempted to put forward their findings, Fred Singer managed to construct a counternarrative explanation. Using his position as chief scientist for the U.S. Department of Transportation, Singer suggested fixing the ozone hole was not necessary because the science had not been proven. He ran an active media campaign in probusiness media like *The Wall Street Journal* and *Fortune* as well as anti-communist newspapers like *The Washington Times* and *National Review* suggesting the problem of ozone depletion was overstated and of no great consequence.

Despite mounting scientific evidence of the existence of the ozone hole, Fred Singer continued to argue against it from 1988 through to 1995. He suggested scientists were doing this to line their own pockets so they could scare up research grants. He also put forward another more sinister explanation for what the science community were saying. “Some of these ‘coercive utopians’ are socialists, some are technology-hating Luddites; most have a great desire to regulate – on as large a scale as possible.” By suggesting environmental regulation was part of the slippery slope towards communism, Singer succeeded in attacking the mainstream view of almost all other scientists for an extended period of time.

Secondhand Smoke – Bad Science or Even Worse Politics?

When the Surgeon General issued a report in 1986 which concluded secondhand smoke could cause cancer in otherwise healthy nonsmokers, Fred Seitz, Fred Singer and the Tobacco Institute sprung into action. They began a smear campaign to discredit everything the Environmental Protection Agency was trying to achieve when the EPA took practical steps to limit indoor smoking. They also set up special projects to try and generate countervailing scientific evidence, put forward expert witnesses who could provide details about what could be termed the “other side” of the story and ran industry-sponsored conferences to challenge the emerging scientific consensus. In other words, Singer reverted to type and tried to fight science with science – or at least to create that impression in the minds of the public.

When the EPA issued its report entitled “Respiratory Health Effects of Passive Smoking” in December 1992 attributing 3,000 lung cancer deaths and more than 150,000 cases of bronchitis and pneumonia in infants and children every year to secondhand smoke, Singer and Seitz were ready to respond. They attacked the credibility of the EPA by suggesting in the media:

1. All too often, science is manipulated to fulfill a political agenda.
2. Government agencies betray the public trust when they violate the principles of science for politics.
3. The EPA has a track record of adjusting science to support preconceived political agendas.
4. Any public policy decisions based on bad science impose enormous and unnecessary costs on society.
5. The EPA’s reports often allow political objectives to guide their scientific research.
6. Proposals which single out tobacco smokers jeopardise individual liberties.

This two-pronged approach of suggesting the EPA used “bad science” and blaming the messenger rather than focusing on the substance of what was being suggested worked exceptionally well. The Tobacco Industry’s call for “balance” and the rejection of “junk science” also resonated with many people. A ginger group was set up called The Advancement of Sound Science Coalition to try and discredit what the EPA was saying.

Eventually, however, the EPA was able to respond to this onslaught of misinformation. The EPA established a Web site: Setting the Record Straight: Secondhand Smoke is a Preventable Health Risk. The Surgeon General, the National Cancer Institute, the U.S. Department of Health and Human Services and many major health organizations endorsed what the EPA was saying and the methodologies which had been used. The real smoking gun in this situation was the fact while adults may choose to smoke knowing the potential health risks involved, children who were exposed to secondhand smoke did not make that decision for themselves. Eventually, despite a multimillion-dollar campaign against the EPA, people realized that was the crux of the issue when it came to secondhand smoke. This wasn’t about whether or not restricting the sale and use of tobacco products was an attack on the rights of smokers. It was about whether one part of society was legally engaging in one type of activity (smoking) which could kill innocent people from another sector of society pure and simple.

Global Warming – Scientific Fact or Scientific Trojan Horse?

Most Americans probably have the impression global warming is something scientists have only recently latched on to and that this is still a highly controversial topic in science circles. The reality is quite different. Global warming has been widely accepted since 1995 and today only a tiny (but vocal and media savvy) handful of scientists deny it.

“Global warming would become the mother of all environmental issues, because it struck at the very root of economic activity: the use of energy. So perhaps not surprisingly, the same people who had questioned acid rain, doubted the ozone hole, and defended tobacco now attacked the scientific evidence of global warming.”

In 1995, the Intergovernmental Panel on Climate Change (IPCC), the world’s leading international research organization on climate, concluded that human activities were affecting the global climate. By the time the IPCC issued its fourth assessment report in 2007, most scientists called the conclusions unequivocal. Yet despite that, the United States has been slow to respond. One reason why is because of all the market confusion about global warming which has been generated by Bill Nierenberg, Fred Seitz and Fred Singer.

The first U.S. president to publicly mention global warming was Lyndon Johnson. Since his administration, the White House has periodically asked groups like the National Academy of Sciences for more information about global warming. When a major climate change study was commissioned by the Academy in 1980, Bill Nierenberg was its chair. The natural sciences people on the committee disagreed with the economists and the end result was a report which put forward two opposing perspectives on whether or not global warming was a proven fact in the scientific world. The report also recommended the United States do nothing until the facts became clearer and hopefully by the time the problem became better defined, technology will have developed a way to mitigate the impact of global warming anyway.

By the time George H.W. Bush became the forty-first president of the United States in 1989, he promised to counter the “greenhouse effect with the White House effect” – that is, to bring the power of the presidency to bear on the challenge of global warming. Scientists assumed this meant the United States was going to get into action but Fred Singer and the Marshall Institute fired their first salvo in deflating the political will to act. Singer released a report which attributed global warming to the sun, to volcanoes and to greenhouse gases acting in combination. When the IPCC was finally able to point out all the discrepancies and factual inaccuracies in the Marshall Institute report, Fred Singer started attacking the credibility of the scientists who were advocating global warming. Singer trumpeted to all and sundry: “The scientific base for a greenhouse warming is too uncertain to justify drastic action at this time” – which was precisely what he had previously said about acid rain, ozone depletion, the impact of secondhand smoke and the links between cancer and smoking. Singer’s comments were widely published in the mass media but when scientists attempted to rebut those arguments with facts, the editors of those publications were fairly non responsive. This created the situation where the scientists were forced to publish their response in the scientific journals instead which had only a fraction of the reach of the mass media which Singer used to discredit them.

Singer and Nierenberg also attacked directly the integrity of the scientists who were serving on the IPCC. Report author Ben Santer was accused of doctoring the IPCC’s reports to make them appear more definitive and more alarmist than they really needed to be. These accusations centered around the normal academic process of peer review and the corrections and clarifications are an integral part of that peer review process. This is a widely accepted practice in academia for ensuring any factual errors are caught and corrected. Singer and Nierenberg made it look like the IPCC was trying to fudge the facts and adjust the data to fit some predetermined theory rather than let the facts speak for themselves. The end result of all this was most members of the public came to assume global warming was still under intensive debate in scientific circles whereas the matter was long ago settled in the minds of most climate scientists.

Conclusion

The First Amendment enshrined freedom of the press as one of the key counterbalances to unbridled power in a democracy. Nobody doubts citizens need information to make decisions and the existence of a free and unfettered press is absolutely critical to the flow of that information. Hand-in-hand with that freedom of the press idealism comes the notion of “fairness” – that both sides to any controversy require equal time to put forward their respective views. In an ideal world, fairness is a worthy ideal but the problem is the real world is messy and contradictory. If every voice gets given equal time, the result is sometimes a confused clamor for attention where a thousand voices are simultaneously demanding to be heard at once.

The actions of Fred Singer, Fred Seitz and Bill Neirensberg illustrate the distortions which can arise at times with perfect clarity. By virtue of the fact these scientists had helped build the atomic bomb, participate in Cold War weapons programs and serve in prestigious positions, they had connections with admirals and generals, congressmen and senators, even presidents. Despite the fact they had no particular expertise in environmental or health sciences, nor had they personally carried out any original scientific research in any of these fields, these prominent scientists have managed to insert themselves into the public debate as “authorities” on every scientific issue which has come up over the past quarter century – tobacco, acid rain, star wars, the ozone hole, secondhand smoke, global warming and even the use of DDT.

In each of these cases, Singer et al have used the same Tobacco Strategy over and over:

1. Use scientists to try and refute the claims of other scientists, thereby creating the impression the underlying science is controversial and open to interpretation.
2. Inject into the public debate alternative explanations – like global warming is caused by volcanoes or the cause of any individual’s cancer can never be definitively established with certainty.
3. Stress the academic credentials of those who express doubts.
4. Use the mass media to create the impression there are two sides to every question and that facts are not necessarily definitive.

“Sensible decision making involves acting on the information we have, even while accepting that it may well be imperfect and our decisions may need to be revisited and revised in light of new information. For even if modern science does not give us certainty, it does have a robust track record. We have sent men to the moon, cured diseases, figured out the internal composition of the Earth, invented new materials, and built machines to do much of our work for us – all on the basis of modern scientific knowledge. While these practical accomplishments do not prove that our scientific knowledge is true, they do suggest that modern science gives us a pretty decent basis for action. S.J. Green, former director of research for British American Tobacco said: ‘A demand for scientific proof is always a formula for inaction and delay, and usually the first reaction of the guilty. The proper basis for such decisions is, of course, quite simply that which is reasonable in the circumstances.’ The doubt-mongering campaigns we have followed were not about science. They were about the proper role of government, particularly in addressing market failures. Because the results of scientific investigation seemed to suggest that government really did need to intervene in the marketplace if pollution and public health were to be effectively addressed, the defenders of the free market refused to accept those results. The enemies of government regulation of the marketplace became the enemies of science.”

– Naomi Oreskes and Erik Conway