

## **How special interests manipulate science to the detriment of the public health**



**Manipulating science is an effective way to keep dangerous products on the market, fight off protective pollution standards and support political ideology. We summarize and review five books provided by credible academic authors, as well as one film.**

*Keywords: manipulate science, bend science, manufacture doubt, product defense, tobacco science, chemical industry, wireless industry, pharmaceutical industry, government, environmental health*

There is a myriad of ways unwelcome science can be bent, distorted, buried, discredited, blocked, ignored and spun when the results threaten the bottom line or political ideology.

This is a very serious topic, since science is used to shape public policy, public opinion, court rulings, and regulation of many industries. Decisions on whether to

release a new drug, setting new pollution standards or restricting the sale of certain products are heavily influenced by science—as they should be.

Science also influences itself. It shapes the thinking of other scientists, including what they will study, and whether they can get funding to do it.

Enormous amounts of money can be lost when science shows that a product is harmful to human health. If it comes out in the media, people may stop buying the product, or a government agency may restrict the sales. Or it may become expensive to comply with strengthened pollution standards, whether it is inside a factory or the amount of pollution found in the air or drinking water in the area near the plant.

A pharmaceutical company often spends hundreds of millions of dollars on developing a new drug. That investment becomes endangered if the drug has serious side effects or it is no more effective than a cheap generic drug. That creates a powerful incentive to fight the facts as well.

Sometimes unwelcome science can run into political problems. The results may run against political ideology or put restrictions on people's freedom to do as they please. Or it can pose a burden to the military.

If large amounts of money are involved, then a technical problem quickly becomes political simply because of the influence industry has over the politicians and government agencies.

Grassroots organizations can also be threatened by unwelcome science, and try to spin the results, though they rarely have the financial resources needed to do it as effectively. If a manufacturer makes millions of dollars a year selling a dangerous product, then it may make sense for them to spend, say, a hundred thousand to delay a ban for even just a year. In some cases, it makes financial sense to spend tens of millions of dollars to fight off unwelcome science. Grassroots organizations simply cannot match such numbers.



*Drinking water standards are contested by special interests.*

The Environmental Protection Agency (EPA) was created by president Richard Nixon in response to public outrage fueled by Rachel Carson's book *Silent Spring* and a slew of scandals. The Love Canal chemical waste dump and the burning Cuyahoga River were some of the most famous events. Soon after, several agencies focusing on protecting the health of factory workers and other employees were also created. These agencies were a direct threat to the bottom line and have been attacked by special interests ever since.

### **Real-life effects**

Manipulating the science and public policy has real-life effects on everybody. It is hard to get definite data, but it is estimated that the delaying tactics to keep one dangerous drug on the market for four more years cost at least 26,000 people their lives. That is probably the worst example, but there are others where the victims are in the hundreds or a few thousands.

Nobody knows how many lives were lost due to the forty years industry was able to delay the phase-out of tobacco and asbestos. Combined, it may be millions.

There are no estimates on how many people have permanently gotten sick from exposure to toxic chemicals and then been denied compensation and even disability payments, because the issue is artificially kept controversial. These are lives ruined twice over.

When it has been in their interest, big firms have worked on casting doubt that repetitive stress injuries, asbestos lungs, chemical sensitivities and electrical sensitivities were legitimate illnesses.

The chemical industry in the United States got on full alert about the threat from MCS around 1990 and were actively involved in halting the growing acceptance of the illness.

It is seldom that these tactics are punished, as those doing it can claim rights of free speech and that they innocently didn't know better. A row of tobacco executives lied under oath at a Congressional hearing, but none of them were punished.

The tactics of the tobacco industry are extremely well documented, since they kept all their internal documents and courts ordered them released to the public. Documenting that the industry knew their products were dangerous was used to exact heavy fines on them.

Other industries learned the methods of the tobacco industry and put them to use. Seeing that internal archives may one day be made public probably means that they also make sure to purge incriminating evidence, so we may never see such good documentation again.

As more people become aware of these manipulations, including politicians, judges, agency officials, and the general public, there is real danger that all science will lose credibility, despite that most science is done by people with high ethical standards. The 2016 political campaigns in the United States were dominated by fake news stories, and politicians claiming that embarrassing (but credible) stories were "fake" as well.

The loss of trust in science could have widespread consequences, including that people believe their own instincts and biases are just as good as objective science. A loss of trust in science plays into the hands of those who manipulate the public opinion.

There are several books available that explore these sordid affairs in depth. Those listed here are all by credible authors, most of whom are affiliated with

universities, and they reference credible sources. The books also complement each other, there are no contradictions. These are not wild-eyed conspiracy theories, but well-documented facts you can check for yourself, as much of the referenced material is available on the web.

The focus of these books is on the United States, with a few examples from other countries. Manipulating the scientific process can happen anywhere and the decisions made in the United States often influence decisions in other countries. Free trade agreements also make it more difficult to ban the import of materials legally sold in the United States.

### **What is manipulated?**

The list of topics that have been subject to manipulation is very long, according to these books. They fall into these categories:

- chemicals (pesticides, dioxin, flame retardants, benzene, BPA...)
- minerals (asbestos, lead, mercury, beryllium...)
- prescription drugs
- tobacco
- food additives (sugar, artificial flavoring)
- ergonomic standards
- mobile phone radiation
- air quality standards
- acid rain
- ozone layer
- climate change
- consequences of nuclear war
- birth control

All of the above have direct or indirect effect on the public health.

### **Bag of dirty tricks**

These books reveal an extensive list of dirty tricks that can be highly effective when used by skilled and well-financed operators. They have evolved over nearly a century.

Some of these methods seem right out of George Orwell's *1984*, about a dystopian future where people are manipulated to think in certain ways. (The story was published in 1948 and inspired by the Nazi regime's skilled propaganda.)

There are consulting firms that specialize in organizing the defense of beleaguered products. Several industries pool their resources to create their own outfits—the most infamous being the now-disbanded Tobacco Institute. These organizations wrap themselves in a veneer of respectability by calling themselves an “institute” and claim they are “independent,” perhaps even claiming to do “sound science,” while referring to results they don’t like as “junk science.” But their focus is not arriving at the truth or at what serves the public good.

An effective method is to create your own science that supports your own agenda. There are always scientists hungry for funding and they can be controlled in various ways. The contract can stipulate how the science is to be done, or if the preliminary results are not as desired, the funding can be cut so the study is never finished. There are many other ways as well.

Scientific journals have reviewers to check that the studies appear reasonably done, but it can be difficult to spot clever tweaks. If the tweaked study does not make it into a reputable journal then there are less-reputable journals, including journals controlled by the same industry that paid for the study.



*Air pollution standards are contested by special interests.*

Even if a study, article or report is later repudiated, it may already have served its purpose. Its release may have been timed to influence a lawsuit, a congressional committee or a government agency making a decision. Or it was published with much fanfare in the media and helped shape the public opinion, while repudiations seldom receive any media coverage. If a government agency is finally ready to

enact a new limit for a pollutant, then the timed release of a “new and important” report can delay things for a year or more.

Legitimate science that causes trouble for someone can sometimes be made impotent in ways that look quite legitimate to politicians, journalists and even other scientists. This can be done by orchestrating letter campaigns to scientific journals, with scientists paid for their effort. Sometimes ghostwriters write the actual letter, which the scientist then edits and signs. To outsiders it looks like a healthy and vigorous scientific discourse, as only specialists will be able to really see what is going on.

Another common tactic is to demand absolute proof, which will be very expensive, take a long time and may never happen. Few decisions are based on “absolute” proof, where “overwhelming evidence” is quite good enough.

Detractors may also say that because a chemical is dangerous to lab rats, that doesn’t mean it is to humans. They know very well it is unethical to expose humans to something expected to be dangerous.

A stronger way to discredit a study is to obtain the raw data and then keep tweaking it until the result becomes “inconsistent,” “inconclusive” or even benign. There are consultants specializing in such reverse science.

More crass methods of harassment are sometimes used, involving complaints to the agency or foundation that paid for the study, allegations of scientific fraud, frivolous lawsuits, subpoenas, excessive record requests and more. Such harassments take a lot of effort to repudiate, essentially halting the scientist’s real work, and usually permanently taints the scientist’s reputation, even when the scientist is later exonerated. Harassments may convince a scientist, and her colleagues, to stay clear of certain subjects, leaving the field to scientists “friendly” to the special interest’s agenda.

An industry-sponsored front organization can host a stacked panel of “blue ribbon” scientists to issue a report commenting on an issue. It will look even better if they can get the chair of a congressional committee to host such a stacked panel, or get a government agency to do it.

Even if such a panel contains mostly honorable scientists, and the report is honorably done, the leader may make the executive summary conclude something else entirely. Few journalists and politicians read anything beyond the executive summary.

It can also be very “helpful” if the leadership of government agencies can be stacked with people sympathetic to the industry they regulate. President Obama’s appointment of mobile phone industry lobbyist Tom Wheeler to head the Federal Communications Commission and president Trump appointing Scott Pruitt to head the Environmental Protection Agency are such examples. Another way of influencing regulatory agencies is the “revolving door,” where agency personnel who have been “helpful” to industry can count on a well-paying job there later on.

The Reagan administration (and later the Trump administration) have also curbed unwanted science by cutting budgets to government institutions so the agencies are forced to lay off scientific staff.

If all else fails, a well-organized media campaign may take care of the problem. These can be made to appear as if the citizenry spontaneously became outraged over something, or against a government agency. The U.S. Environmental Protection Agency (EPA) is a nuisance to the polluters and continuously the target of such smear campaigns.

Manipulating the public mind is also important in some cases. Very few members of the public read the scientific reports, most get all their information from the media. Journalists are busy and unlikely to read more than the summaries of a few reports, if even that. Some industry operators produce briefings, ready-made articles and television spots that the media can freely use. It is easy to make it look to the public that there is serious scientific uncertainty about a subject, even though there actually isn’t.

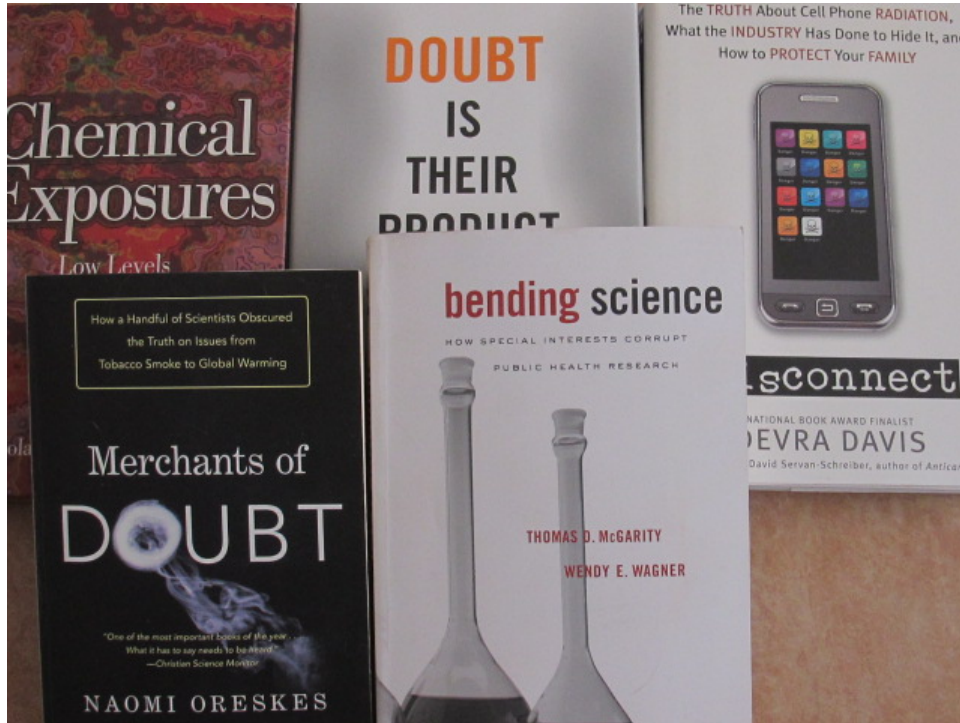
The books also tell stories about how a little cash can help getting columnists and editors to cover an issue more favorably.

All these tactics have been very successful. There are several cases where they have delayed banning or restricting toxic chemicals for 30 to 50 years, or even permanently prevented an agency from regulating a clearly dangerous product.

## **The books**

This review is based on five books that are all written by reputable authors affiliated with reputable institutions.





This reviewer's favorite is:

*Bending Science: how special interests corrupt public health research* by Thomas D. McGarity and Wendy E. Wagner (Harvard University Press, 2008).

The two authors are both law professors at the University of Texas.

The first two chapters are a little heavy to get through, but then the book becomes a rather easy read with lots of real-life examples on how these methods were actually used, by whom and what the outcome was. The examples are referenced for more detail. There are at least fifty of these dodgy stories. Most of the manipulators are corporations, but there are a few government agencies, politicians and grassroots organizations as well.

The bulk of the book is really a detailed catalog of the dirty tricks that can be employed against unwanted science—a sort of “science saboteur’s manual.”

The most chilling part is that nearly all the stories have a bad ending, meaning the dirty tricks were successful and the good guys lost.

There are just a few examples where the attempts backfired, such as when a hired scientist defied the gag clause in his contract and went public with what he found,

despite a million-dollar lawsuit to silence him. Or when a supposedly “stacked” science panel did not produce the expected report exonerating a dangerous drug and actually launched a public campaign against their sponsor.

But such displays of courage are rare.

In one chapter we hear about a firm specializing in fighting against unwanted science with extensive quotes from the firm’s promotional material used to attract new customers. The descriptions of their “successes” are particularly worrisome.

The head of one such firm is quoted saying:

In this era of exploding media technology, there is no truth except the truth you create for yourself.

We also hear about the process of getting scientists to help special interests:

Regulatory policy is increasingly made with the participation of experts, especially academics. A regulated firm or industry should be prepared whenever possible to co-opt these experts. This is most effectively done by identifying the leading experts in each relevant field and hiring them as consultants or advisors, or giving them research grants and the like. This activity requires a modicum of finesse; it must not be too blatant, for the experts themselves must not recognize that they have lost their objectivity and freedom of action.

In 2005 there was a major scandal at the U.S. National Institute of Health (NIH) when it was discovered that 530 of their 1200 senior scientists had financial ties to the drug industry and thus conflicts of interest involving their work. Management was only able to restrict these problems to some degree as they would otherwise face a mass exodus of their senior scientists moving to better-paid work.

Most of the stories are about big corporations, but in chapter 5 (Hiding Science) we are told the story about the White House hushing up the EPA about the toxic cloud from the burning World Trade Center in 2001. (The Japanese government did the same with the nuclear disaster in Fukushima, though that happened after this book was published.)

The Reagan administration also threatened the National Institute on Drug Abuse (NIDA) with deep budget cuts if it did not stop looking into the addictiveness of nicotine, after they were contacted by tobacco lobbyists.

It took guts to publish this book, as it points fingers at so many powerful corporations and politicians.

The book has no less than 75 pages of references, which should serve as a bulwark against defamation lawsuits as the truth is the best defense.

The last two chapters discuss how scientists, journals, universities, the courts, government agencies and the media can combat distorted science. Hopefully they will.

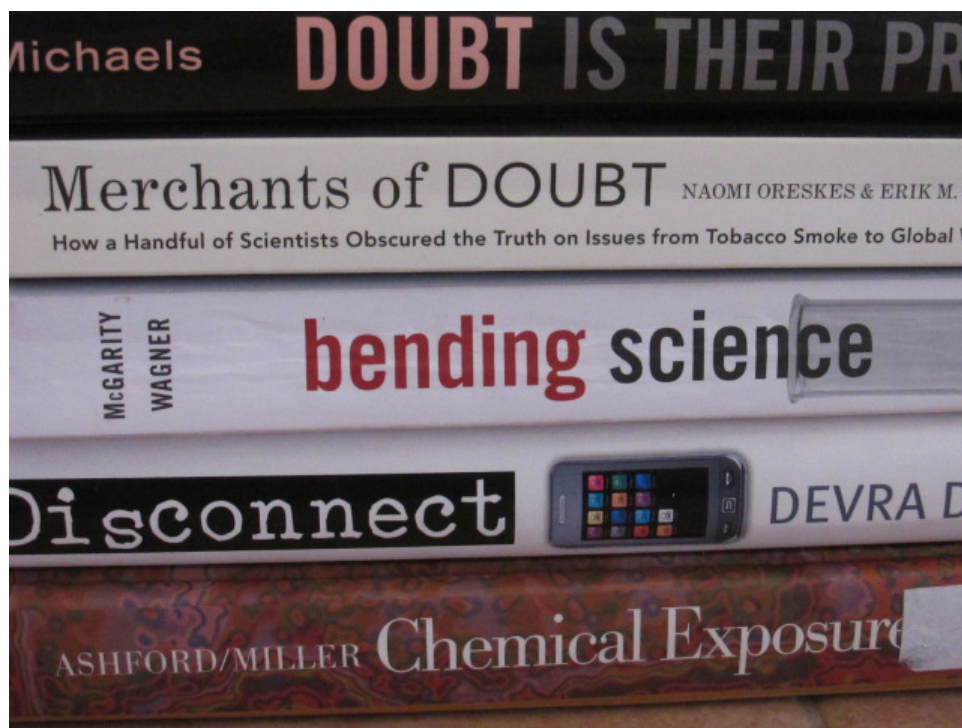
*Doubt is Their Product: How Industry's Assault on Science Threatens Your Health*, by David Michaels (Oxford University Press, 2008).

David Michaels is an epidemiologist and a director at the George Washington University School of Public Health. He was previously a government official tasked with overseeing workplace safety in the nuclear weapons industry.

He has sat across the table from many industry representatives and seen first-hand how the industries tried to twist and obfuscate the science to save money while not having much concern for the health of their employees. He covers many topics, especially those worker protections he personally was involved in, including beryllium, diacetyl (artificial butter flavoring) and ergonomics (preventing bad backs).

This book is an excellent continuation of *Bent Science* as it goes deeper into how scientific studies can be skewed to arrive at the desired “no problem” outcome and we are told a whole new set of stories. There is very little overlap between all these books.

David Michaels is an epidemiologist, which is the science of determining whether a group of people (or lab rats) exposed to a chemical is made sick by it. This is typically done by comparing with another group that is not exposed to this chemical.



Michaels explains how the scientific process works, so we can understand the ways it can be tweaked by unscrupulous scientists. He provides a “devil’s cookbook” on how to do these things, complete with lots of examples from real life.

In one case, an industry-funded study on employees at a refinery included many employees who worked at a control center far from the refinery. This diluted the pool of “exposed” workers to make it look like few people got sick.

Another way is to add exposed workers to the control group of “unexposed” workers, to make the two groups look the same. An example of that (not from Michael’s book) was used by the mobile phone industry, where they compared cell phone users in Denmark with users of cordless phones (which radiate similarly) instead of people who didn’t use radiating phones.

Another tactic is to limit the study to a timeframe so diseases do not have time to develop. If a study is limited to ten years, and the cancer takes twenty years to develop, then “no problem” is easy to achieve.

He takes the industry to task about its practices throughout the book, including this statement:

Perhaps the sleaziest behavior of all, though, is their practice of denigrating scientists and studies whose findings do not serve the corporate cause.

One of the stories is about the multi-decade battle over the chemical benzene, which causes leukemia. Benzene is widely used and is a main ingredient in gasoline, so the cost of protecting employees in the oil industry and other users would be high. The industry spent enormous amounts of money fighting protective standards, including several “cooked” reports, of which the most expensive cost \$22 million. It was worth it to them, as reducing their pollution would cost more.

He tells us that as early as 1898, British inspectors noted that asbestos made people sick. By 1918 insurance companies in the United States and Canada refused to issue life insurance for asbestos workers. Yet it took until the late 1960s before the industry phased out their cooked-up studies “exonerating” asbestos.

Both the tobacco industry and the asbestos industry published studies linking lung problems with “certain personality types” (a ruse also used against MCS).

He explains how regulatory agencies determine what limits to set, which is a laborious process taking years to complete. And then when it is nearly done, industry, with perfect timing, produces a new report that must be considered and refuted, which costs a lot of time, so it may delay the new limit by yet another year. Or it may be longer, since the agencies are chronically overworked and underfunded.

He provides a roster of front groups, product defense firms and scientists specializing in creating these skewed reports and who can show up as “expert” witnesses in courtrooms and at public hearings. They serve a wide range of industries and have been employed to cast doubt about the dangers of various chemicals, heavy metals, ozone layer destruction and much else.

In 1992 the tobacco industry realized that the Environmental Protection Agency was their main enemy. An internal memo laid out a strategy:

The credibility of EPA is defeatable . . . It must be part of a larger mosaic that concentrates all of EPA's enemies against it at one time.

A wide group of large corporations from diverse industries regulated by the EPA joined forces in attacking the EPA politically and in the public media. A campaign that continues to this day.

The book has a separate chapter about the pharmaceutical industry. The marketing of a new drug is a high-stakes game with literally billions of dollars at stake for a blockbuster drug. It would be terrible if a drug proves to be no more effective than a cheap generic drug, or the side effects are too severe.

New drugs are tested on humans several times before they can be marketed. Michaels provides a list of six “widely used tricks” to make such drug trials produce positive results.

The prestigious medical journals are fully aware of this, but they are outgunned by the pharmaceutical industry. The deputy editor of the *Journal of the American Medical Association* (JAMA) is quoted:

This is all about bypassing science. Medicine is becoming a sort of Cloud Cuckoo Land, where doctors don’t know what papers they can trust in the journals . . .

In some cited cases, released drugs turned out to kill people. In a particularly grueling example, a painkiller killed an estimated 26,000 to 55,000 people during the four years the drug was on the market. These were preventable deaths.

In another case, a drug killed hundreds of children. As Michaels comments:

. . . if a medication that carries a likely risk of disease and death in children is considered fair game for a corporate cover-up, *what isn’t?* (emphasis in original)

Though it does seem that the drug industry avoids shenanigans with the safety tests, simply because they can get severely hammered by a class-action lawsuit. It is when the danger is a surprise that the cover-ups happen.

The book also covers the assistance politicians have provided. The Shelby Amendment and the Data Quality Act were both sneaked through Congress as just a few lines added to large unrelated bills. On the surface they seem a very laudable means to improve the quality of data produced by government agencies. But in practice they are excellent tools to harass government funded scientists.





When the federal agency tasked with protecting employee health, OSHA, announced that about one million annual work injuries were related to poor ergonomics (repetitive stress injuries, bad backs, etc.) and wanted to create an ergonomic standard, several industry sectors swung into action. They simply got Congress to make a law that forbade OSHA from making such a standard and for good measure they also forbade OSHA gathering any more statistics on the issue. The blackout on statistics was removed two years later, but still, that's a brassy way of making a problem "disappear." OSHA was eventually allowed to proceed, thanks to a presidential intervention. The special interests then resorted to the usual tricks, including claiming that:

"leading physicians and medical organizations dispute that [repetitive stress injuries] actually occur."

When OSHA eventually enacted an ergonomic standard, Congress promptly repealed it, with the help of a new president. End of story.

Michaels tells a similar story about the toxic metal beryllium, which he was involved with himself as a regulator. The industry won. Curiously, the main opponent to regulation cleaned up its factory anyway. So why fight the standard they voluntarily follow anyway? Apparently it was because customers won't buy products made with a toxic metal, and having a loose standard also helps fight off liability claims from workers who get cancer.

With all this industry-friendly support, the courts are the main bulwark left to protect the public health. As a lawyer is quoted saying:

. . . the main thing the corporations really fear these days is a jury.

Unsurprisingly, there have long been calls for “tort reform” to keep the courts in check, and get judges appointed who are less sympathetic towards injured people.

In 1993 the U.S. Supreme Court created the Daubert rule that makes it much harder for an injured person to present expert witnesses to a jury. (Many MCS court cases in the 1990s were lost on this rule.)

*Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, by Naomi Oreskes and Erik M. Conway (Bloomsbury Press, 2010).

Naomi Oreskes is a professor of history and science at the University of California, San Diego. Erik Conway is a historian of science and technology.

This book focuses on the campaigns of disinformation waged against science and scientists in the media and the political arena. We also follow the careers of a handful of scientists who have spent decades defending corporate and ideological interests against unwanted science on a variety of topics:

- second hand smoke
- ozone depletion
- acid rain
- the winnable nuclear war
- climate change

In each of these cases they successfully delayed government action for several years. The climate change campaign is still ongoing.

When science started to document that cigarette smoking also harmed nearby non-smokers, the industry went into full gear to prevent restrictions on smoking inside buildings. According to the book, they also paid a famous actor \$500,000 to smoke in five of his films.

Around 1970 it was discovered that the earth’s protective ozone layer in the upper atmosphere was getting thinner. The cause was CFCs, a class of chemicals used in



air conditioners and spray bottles. The ozone layer blocked ultraviolet radiation from the sun, and stronger UV would cause skin cancer and eye damage in humans and animals.

The CFC industry immediately launched a campaign with front groups to question and delay. In 1987 president Ronald Reagan's Secretary of the Interior tried to brush the problem off with a remark that people just needed to wear hats and long sleeves.



Eventually the United States signed and ratified the Montreal Protocol. The protocol stipulated a gradual reduction of the production of CFCs. The chemical giant DuPont acted admirably and announced it would stop the production of CFC much faster than the Protocol required.

By 1979 there was already scientific consensus that acid rain was a serious problem and that the main cause was coal-fired power plants. The United States and Canada were negotiating reductions in sulphur emissions. Then Ronald Reagan took office in January 1981 on the promise of less regulation of industry, and things changed. An example was that the Reagan White House planted an agent on the National Academy of Sciences committee summarizing the science on acid rain. This agent was at odds with the eight other scientists on the panel. The panel's report was also edited by the White House and released without the panel's approval. Throughout the Reagan years, the official position was "we don't know what causes acid rain," and that in any case, pollution controls were

too expensive. Up through the 1990s they kept claiming that the science wasn't settled, and the problem was limited, anyway.

A "winnable" nuclear war was the idea that if the United States had an overwhelming number of nuclear warheads and built a space-based system to shoot down nuclear missiles coming from the Soviet Union, then it was possible to win a nuclear war. Some even suggested the United States should start such a war to get rid of the communist menace once and for all. Several scientists pointed out the problems with this rosy picture. One problem was that no anti-missile system could possibly stop every single missile. Another was that such a war would put so much dust and smoke in the atmosphere that the sun would be blocked out and the entire planet plunged into a year-long winter, with massive crop loss and famine the result. These unfortunate side-effects were hotly contested for ideological reasons. Fortunately, the collapse of the Soviet Union in 1989 made the topic moot.

The climate change debate receives more coverage in this book than in the others—perhaps because the methods used here were not to create tweaked science, which would not be a useful strategy, as the world's governments funded so much irrefutable science. The science was firm and a scientific consensus reached by 1995, but a well-financed "debate" is kept alive in the United States even more than twenty years later.

The methods used to oppose the science are often callous and Orwellian. According to the book, they hide the financial connections behind various front actors, deliberately misrepresent and misquote scientific information, rewrite history, deny reality, claim facts not based on any science and bitterly complain that they are ignored by the parts of the press and government agencies who are fully aware what these actors are about.

They are not above personal harassment of scientists nor even ridicule. One of the authors of this book was even herself ridiculed by a prominent U.S. senator with links to the oil industry.

We even hear of one case where a scientist was dragged into court on a bogus defamation lawsuit. Unable to match the deep pockets of his attackers, he was financially ruined.

This book tries to discover what motivates the scientists who go against their own kind in support of special interests. The book points out that as scientists, they would often know what they said wasn't true. Sometimes the falsehood was obvious to anyone who would check, such as a claim published in the *Wall Street*

*Journal* that important pages in a climate change report had been removed (they weren't).

The obvious motivation is money, but that is not the whole answer and it's not so simple either. It is not like some corporate guy hands over a suitcase full of cash. It is more sophisticated than that, just as when they buy politicians. It can take years to slowly drag a scientist down the slippery slope of corporate sponsorship, a process that can be expertly managed.

The small group of scientists whose careers we follow seem to be motivated by political ideology. They are apparently libertarian hawks. The book describes them as seeing socialism, communism and the Soviet Union as existential threats to the United States. The Soviet Union must be defeated, restricting smoking is an attack on personal liberty, and government regulation of any kind of pollution is socialism that will eventually lead to communism. These perceived evils must be fought by any means possible.

The book comes to these conclusions based on various speeches and articles made by these scientists.

The other books mention other scientists who defend the corporate interests. Their motivations are not explored.

The *Merchants of doubt* includes 65 pages of references.

*Disconnect: the truth about cell phone radiation, what industry has done to hide it, and how to protect your family*, by Devra Davis (Penguin, 2010).

Devra Davis is a professor and cancer scientist. She tells the history of medical pioneers and their discoveries about the human body's use of electricity, such as in the heart and the brain. This is told in a language so the rest of us can understand it.

She also tells chilling stories about what happened to scientists who discovered health effects from microwave radiation, such as leakage of the membrane protecting the brain and breakage of cellular DNA. When scientists like Franz Adlkofer, Hugo Rüdiger, Allan Frey, Henri Lai, Narendra Singh, Om Gandhi and Dietrich Beischer made such discoveries they were quickly attacked. Some of these attacks were so vicious they seem unbelievable, but then, when billions of dollars are literally at stake . . .

Davis wrote these stories after interviewing the scientists. Her book is written more personally than the other books reviewed here and can seem rather accusatory in some places. It is the most comprehensive source on the mobile phone industry's attempts to fight against protective radiation standards—a fight that has so far been highly successful.

This book is written for a more popular audience and does not include references, though there is an appendix with suggested readings.

*Chemical Exposures: Low Levels and High Stakes* by Nicholas Ashford and Claudia Miller. Second Edition, John Wiley & Sons, 1998.

Nicholas Ashford is a professor at MIT and has served in various advisory roles to the EPA. Claudia Miller is a professor at the University of Texas.

In the second edition of their book about multiple chemical sensitivity, they added a chapter (Reviews, Commentaries and Polemics) about the various tactics used to discredit MCS. They state:

Scientific investigation related to chemical sensitivity is being stymied by scientists and physicians with financial conflicts of interest . . . who serve on government panels, editorial review boards, and grant review committees.

They then finger various attackers, both specific physicians and industry front groups.

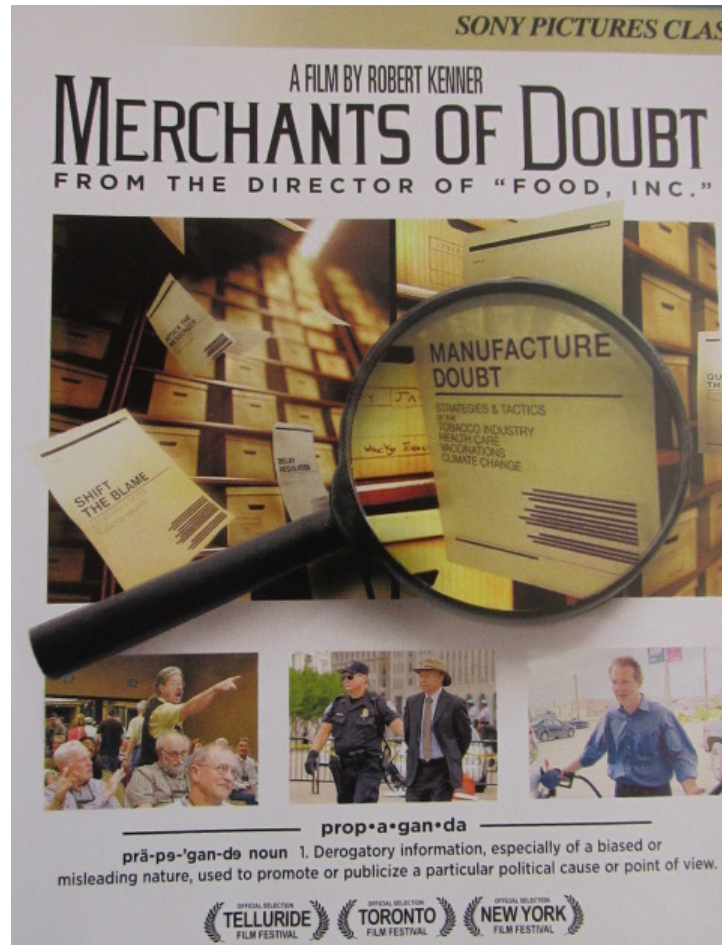
We are also told the story about the attempt to rename MCS as “idiopathic environmental intolerance” and the efforts to get the World Health Organization to support the new name (WHO never did).

More details about the attacks on MCS are available in the article *Multiple Chemical Sensitivities Under Siege* by Ann McCampbell (Townsend Letter, January 2001). Ann McCampbell is a physician who had to give up her practice and has since become an MCS activist. Her article details the various methods used by the chemical and pharmaceutical industry to attack the legitimacy of MCS especially through the now-defunct front organization Environmental Sensitivities Research Institute (ESRI). Her article is freely available on the web.

## Films

*Merchants of Doubt* (documentary film), directed by Robert Kenner (Sony, 2014).

This film is inspired by the book *Merchants of Doubt* and focuses on the extensive propaganda efforts used by industry to convince politicians and the American public that tobacco is safe, flame retardants are necessary and climate change isn't happening.



Throughout the film we see a stage magician explain how he uses deception to fool an audience with his card tricks and other stage craft. This is a convincing way to point out how corporations manipulate the public to believe their propaganda.

It is difficult for people to accept that they have been fooled, as it makes them look foolish. And yet advertising, especially on television, is an effective way to manipulate people and most people understand that.

The film uses a lot of original television footage to demonstrate how industry operators lie with impunity. We see a whole row of tobacco executives testify under oath in front of a Congressional committee that nicotine is not addictive. They did that in 1994, even though internal industry documents from as far back as 1963 show that they knew better.

We see a physician testify in front of a state legislature in favor of flame retardant chemicals. He tells a sob-story about a nine-year-old girl whose little burnt body he was unable to save in his hospital clinic. This emotional appeal brushed away everything else the legislators heard. But the story was completely made up, which the physician admits when confronted with the evidence. He was paid \$240,000 for three such false testimonies, according to the movie.

The bulk of the film is about the campaign to deny climate change. One of the authors of the book *Merchants of Doubt*, Naomi Oreskes, explains how she inspected every article about climate change published in peer-reviewed scientific journals from 1992 to 2002. There were 928 articles. Out of those, there were exactly zero that claimed climate change was not happening. This, despite the vocal climate change deniers stating there is widespread disagreement in the scientific community.

When Naomi published this finding in the prestigious journal *Science* she was inundated with hate mail and highly critical notes from a few scientists. She discovered that these scientists had also actively condemned other scientists she knew personally, but worked in other fields threatening special interests, such as acid rain and the ozone hole. The film interviews a scientist who used to be an apologist for the tobacco industry; he is now a prominent denier of climate change.

We see how innocent-sounding “grassroots organizations” really are fronts for special interests, with no members from the public at all.

There is lots of footage of employees of such front groups and industry-financed think tanks who go on TV and pose as experts to debate climate change with the real experts. They lack expert knowledge on the subject, but they are expertly trained in debating on TV and thus easily trounce the real scientists.

Surprisingly, one of these operators agreed to be interviewed for the film and he admits to his sordid methods.

We also see some of the other dirty tricks, such as the deceptive “climategate” and a statement signed by 31,000 non-existent scientists (or dead scientists, such as Benjamin Franklin). These were released with perfect timing to disrupt two

climate conferences. By the time the allegations were fully investigated and repudiated, the conferences were over and the media no longer interested, so the false allegations continued to stick in people's minds, as intended.

The film's in-your-face tabloid-style format is a bit offputting to this reviewer who much prefers calm, reasoned books. But this type of investigative program is popular and this film can reach audiences the books cannot.

### **Other films**

There are other films touching upon these subjects. The films *Erin Brokovich* and *A Civil Action* are both dramatizations of real events where small towns fought corporations that poisoned their drinking water.

The film *Thank You for Smoking* is a fictional story of a smooth-talking spin-doctor who works for the tobacco industry. He ends up working for the mobile phone industry.

### **The basic problem**

The basic problem is that public opinion is shaped by popular media and social media. Journalists and the general audience do not read the scientific literature and rarely even read a book like the ones reviewed here. To many, an article longer than a page or two is too long.

This makes it much easier to manipulate any public debate. A well-financed media campaign can get false "facts" repeated endlessly, so it becomes true in the public mind—especially if the message fits people's ideology. The climate-change deniers found a very receptive audience in the United States, where the thought that the government might restrict the use of gas-guzzlers was an abhorrent thought to many people.

People also don't like to hear that the household products they use, and constantly see on commercials, are harmful to some people.

Politicians want to be re-elected so they are sensitive to the public opinion on a subject, even when they should know better.

### **Is it getting better?**

Reading these books and watching the movie is rather demoralizing. The methods documented in these books have been widely successful against protections of the public health. Even delaying regulations for some years is a success.

In most cases, the public interest does win in the end. The United States did not launch a nuclear war against the Soviet Union, and cigarettes, asbestos, DDT, lead, mercury and many dangerous drugs are strongly restricted.

But the David Michaels book mentions several dangerous substances where the EPA or other agencies did not have the resources to fight a prolonged battle and simply gave up. They are still out there.

The tug-of-war continues. Even asbestos is not totally dead; as recently as 2003 the EPA published a brochure on how auto mechanics can safely handle asbestos brakes, but retracted it without a fight when the asbestos industry got upset that the brochure insinuated that asbestos was a health problem!

In the March 2018 issue of *Scientific American*, commentator Andrew Rosenberg (“Time for a Reboot in Congress”) points out recent cases of political interference with science and scientific advisory boards for government agencies.

In 2015 German auto maker Volkswagen was accused of installing special software in the diesel cars to defeat emissions tests. The scandal later included several European auto makers. In 2018 the *New York Times* published a story about how Volkswagen orchestrated a fake study about the harmful effects of diesel exhaust on ten monkeys.

The April 23, 2018 issue of *The Nation* contains the feature article “How Big Wireless Made Us Think That Cell Phones Are Safe” by the investigative journalists Mark Hertsgaard and Mark Dowie. The campaign to deny health effects of wireless technologies is still in full swing.

There is still little downside to mounting a campaign of disinformation. It is usually highly profitable to do these campaigns that have worked so well, so they will continue. Since the campaigns documented in these books, new tools of disinformation have become prominent, especially social media.

It is unlikely that the situation is improving.

The EI Wellspring home page: [www.eiwellspring.org](http://www.eiwellspring.org)