

The Fight to Prove that Tobacco and Tobacco Smoke Cause Cancer

As I mentioned last time, the history of the effort to prove that tobacco is hazardous to your health has many familiar chapters that can teach us a lot about the fight to prove that human-induced climate change is causing global warming on our planet.

I'd like to call your attention to a book *Merchants of Doubt* by Naomi Oreskes and Erik Conway, which was published in 2010. I recommend that you read it. Here's the back cover summary:

“Merchants of Doubt has been praised—and attacked—around the world, for reasons easy to understand. This book tells, with ‘brutal clarity’ (Huffington Post) the disquieting story of how a loose-knit group of high-level scientists and scientific advisers, with deep connections in politics and industry, ran effective campaigns to mislead the public and deny well-established scientific knowledge over four decades. *The same individuals* who claim the science of global warming is ‘not

settled’ have also denied the truth about studies linking smoking to lung cancer, coal smoke to acid rain, and CFC’s to the ozone hole. ‘Doubt is our product,’ wrote one tobacco executive. These ‘experts’ supplied it. *Merchants of Doubt* rolls back the rug on this dark corner of American science.”

A few quotes from the book will illustrate why it is worth reading and relevant to our discussion of climate change:

“The Intergovernmental Panel on Climate Change (IPCC) is the world’s leading authority on climate issues. Established in 1988 by the World Meteorological Organization and the United Nations Environment Program....In 1995 [in its Second Report] the IPCC declared that the human impact on climate was now ‘discernible.’....The author of part of the report was Ben Santer, [a well-known climate researcher at Lawrence Livermore National Laboratory] He was accused by a group of physicists tied to a think tank in Washington, D.C. of doctoring the report to make the science seem firmer than it really was.

“A few years later, Santer was reading the morning paper and came across an article describing how some scientists had participated in a program, organized by the tobacco industry, to discredit scientific evidence linking tobacco to cancer. The idea, the article explained, was to ‘keep the controversy alive.’ So long as there was doubt about the causal link, the tobacco industry would be safe from litigation and regulation. Santer thought the story seemed eerily familiar.

“He was right. But there was more. Not only were the tactics the same but the people were the same too. The leaders of the attack on him were two retired physicists, both named Fred: Frederick Seitz and S. Fred Singer....

“From 1979 to 1985, Fred Seitz directed a program for R.J. Reynolds Tobacco Company that distributed \$45 million to scientists around the country for biomedical research that could generate evidence and cultivate experts to be used in court to defend the ‘product.’

“In case after case, Fred Singer, Fred Seitz, and a handful of other scientists joined forces with think tanks and private corporations to challenge scientific evidence on a host of contemporary issues. In the early years, much of the money...came from the tobacco industry; in later years it came from foundations, think tanks, and the fossil fuel industry....they claimed the link between smoking and cancer remained unproven...They argued that acid rain was caused by volcanoes, and so was the ozone hole. They charged that the EPA had rigged the science surrounding secondhand smoke. More recently....they dismissed the reality of global warming. First they claimed there was none, then they claimed it was just natural variation, and then they claimed that even it was happening and it was our fault, it really didn't matter because we could adapt to it. In case after case, they...denied the existence of scientific agreement, even though they, themselves, were pretty much the only ones who disagreed.

“A handful of men would have had no impact if no one paid any attention, but people did pay attention. By virtue of their earlier work in the Cold War weapons programs, these men were well-known and highly respected in Washington D.C., and had access to power all the way to the White House.”
[end quote]

For example, they pioneered a well-known defense of tobacco that was successfully used in many court cases: Someone who smoked died of lung cancer. But lung cancer could also be caused by exposure to asbestos, to various chemicals, and by numerous causes. Therefore you couldn't “prove” that tobacco was the culprit. Also, many people who smoke don't get lung cancer, so, again, tobacco may be guilty or innocent, and it's impossible to say, for a given individual, which.

Their various tactics, outlined in the book, worked for decades until numerous large scientific studies collected enough data to prove beyond a reasonable doubt that tobacco and cancer were linked by cause and effect.

Also, eventually it was shown that the tobacco industry “Knew the dangers of smoking as early as 1953 and conspired to suppress the knowledge.”

The industry “was found to have decades of internal memos confirming in detail that tobacco is both addictive and carcinogenic. The suit resulted in a large cash settlement being paid by a group of tobacco companies to the states that sued.

According to the Tobacco Master Settlement Agreement, the four largest US tobacco companies agreed to pay the states “to compensate them for some of the medical costs of caring for persons with smoking-related illnesses.” The agreement was signed in 1998 and the manufacturers “agreed to pay a minimum of \$206 billion over the first twenty-five years of the agreement, which contained numerous other agreements relating to advertising and the like.

So the progression of things over more than 40 years had:

1. A phase of denial that tobacco was even related to cancer.

2. A phase of suppression of evidence using cooperating scientists.
3. A phase of trying to wear down the opposition by insisting that you couldn't prove a particular individual died on tobacco caused cancer.
4. A phase of wearing down the opposition by getting them to spend all their money on legal action.
5. And finally a phase when the weight of scientific evidence plus evidence of collusion on the part of the tobacco companies brought the matter to a solution.

Not only does the effort to prove that humans are responsible for climate change and global warming have many similarities to the tobacco story but also it has, as you have heard, some of the same people.

I do need to point out that just because the theory that tobacco causes cancer is correct does not necessarily mean that the theory that human activity causes global warming and climate change

is correct, even though similar tactics and some of the same people are involved.

So we've talked now about three situations in which big, complex scientific issues have become even more complex because of the involvement of industries making a profit and politicians.

1. Tobacco companies tried to derail the tobacco causes cancer initiative purely because of a profit motive.
2. Pharmaceutical companies and hospitals ignore the true efficacy of their products and procedures because of the huge profits they supply and by focusing on a few examples of poorly done science.
3. Fossil fuel companies and some politicians deny that human activities cause climate change because of the possibility of decreased profits and increased regulatory costs.

In each of these cases, there are lots of motives involved besides profit. For example politics and government are involved. Politicians

from tobacco growing states want to be re-elected. States with high fossil fuel production want to keep those workers employed, and so on. Hospitals and doctors want to keep profits high. And all these groups of people feel comfortable believing in theories they have believed for their entire professional lives.

There is also the issue of belief. Tobacco companies produce a product that people enjoy. So do fossil fuel companies. Hospitals want to return sick people to health.

An interesting question is how does a completely wrong headed and false point of view gain sway in such a fashion that everyone just “knows” it’s true? Think about the practice of bloodletting, which was common medical practice for thousands of years. It was ineffective and harmful from the get-go, but “everyone” believed it worked and few bothered to question. This got started apparently partly because Galen—an important Roman physician championed it. Where he got it from, I don’t know.

The Hungarian physician Ignaz Semmelweis demonstrated beyond the shadow of a doubt that hand washing lowered obstetric mortality rates of 10%-35% to less than 1%. In his day, at the medical college/hospital, physicians commonly saw patients after working on cadavers and did so without washing their hands.

Initially, he noticed that in one wing of the hospital, where these physicians worked, deaths were high but in another wing of the hospital, where midwives (who didn't work on cadavers) saw patients, deaths were low. Hand washing was his idea to put some "distance" between the cadavers and the patients.

But because his observations conflicted with the established scientific and medical opinions of the time, his ideas were rejected by the medical community. He could offer no scientific explanation and didn't know about bacteria and germs. Some years later Louis Pasteur confirmed the germ theory and Joseph Lister, acting on his research, practiced and operated, using hygienic

methods, with great success. Ultimately, Semmelweis was beaten to death in an insane asylum. [Quoting from Wikipedia about Semmelweis.]

There is no profit motive at work in this sad story, just pig headedness and an unwillingness to take an honest look at the data and to change worldviews. Perhaps Semmelweis' particular personality and the way he put forward his views were to blame as well. No one knows.

But recall the viewpoint of philosopher, Thomas Kuhn, which we discussed several videos ago. He believes that the progress of science is not linear but involves periodic "paradigm shifts" that open up new approaches to understanding that scientists would never have considered valid before.

This seems to explain Semmelweis' difficulty in convincing his contemporaries. The development of germ theory by Louis Pasteur, Robert Koch, and others provided the paradigm shift and the necessary rigorous scientific experiments to back it up. Pasteur's ability to successfully treat a

number of bacterial and viral diseases, including rabies, also caught the public and political eye and helped champion his view.

By the way, lack of hand washing still accounts for many infections and deaths. Please read the waterandhealth.org newsletter by following the link. Here's a quote from that newsletter:

“The U.S. Centers for Disease Control and Prevention (CDC) estimates that 2.4 million Americans acquire an infection in hospitals each year and that half of these infections are preventable by proper hand washing. Furthermore, hospital-acquired infections cause or contribute to 100,000 deaths annually, according to CDC officials. Patient-to-patient transmission of infectious microorganisms can occur via the hands of hospital personnel and contact with contaminated patient-care equipment or surrounding surfaces. Some viruses can survive for up to three hours on inanimate surfaces, such as doorknobs.”

It seems that even though the paradigm has changed, and we know that germs cause disease, hand washing before seeing a new patient is simply too much trouble or not deemed important. But it is.

By the way, as a footnote, *The Journal of Patient Safety* in 2013 published a study claiming that between 210,000 and 440,000 patients each year who go to the hospital for care suffer some type of preventable harm that contributes to their death. That would make medical errors the third-leading cause of death in America behind heart disease and cancer. Medication errors, an overlapping category, cause harm to at least 1.5 million Americans every year according to a 2006 report from the Institute of Medicine of the National Academies.

A more successful intervention in public health was initiated by John Snow, 1813-1858, who is known as the Father of Epidemiology because of his work in tracing the cause of a cholera outbreak in London in 1854. No one knew the cause of the

disease—we now know that it’s a bacterium. But Snow traced the London breakout to water from a particular well. He removed the handle to the well’s pump, and the epidemic ended. His hypothesis was that if he plotted the geography of those people who sickened and died he might discover a clue as to the source of the problem. He was correct.

But what about tobacco and climate change? Maybe they are more complicated than hand washing to avoid disease. And maybe not. In each case, the paradigms that were commonly accepted didn’t involve tobacco as a carcinogen or fossil fuel by-products as serious atmospheric pollutants that could change climate.

Until recent years the science behind tobacco’s causing cancer was not extensive or complete enough to bring skeptics into the fold. That is certainly the case today for climate change.

If three bits of information support human caused climate change, and three don’t, both supporters and deniers have hand holds on which

they can seize to elevate themselves and their point of view. The fact that Gore's book/movie contains some items that appear support climate change, but, on analysis, turn out not to be accurate, supports this point of view.

Also remember that much of the data being collected is complex to analyze and to test for accuracy.

Politicians and business men are sure to favor those scientific observations and studies that support their point of view. As we saw with the tobacco story, money is spent and deceptions spawned to try and support particular spins of a controversial theory.

The polarized state of television and radio news nowadays provides plenty of examples of those sorts of things. According to some sources, the President and Congress can do no right; according to other sources, they can do no wrong. The truth is usually somewhere between in most cases. All too typically these days, news "companies" simply ignore stories that don't support the point of view

they want to champion. In terms of news reporting, sadly, the days of Walter Cronkite, “the most trusted man in America,” and objective reporting are long gone.

Unfortunately, in science, and particularly in big, complex science, human nature—even the human nature of many scientists—is to accept the prevailing paradigm—because it’s familiar, because authority figures support it, because it supports particular political or financial concerns, or *even* because of lack of sufficient evidence to the contrary despite increasing evidence to the contrary.

In terms of climate change and the human impact, the IPCC, and its five reports (1990, 1995, 2001, 2007, 2013), represents the United Nations and “establishment” science and puts forth the hypothesis (and associated data) that human induced climate change is the ‘real deal’ and is going to have a number of dire consequences for the planet in the near and distant future. Recall that

the IPCC along with Al Gore won the Nobel Peace Prize in 2007 for their work on climate change.

The IPCC tends to represent a liberal political viewpoint and is associated with the research and viewpoint of many dedicated scientists. On the other hand, the reports do contain some factual errors, which are inevitable in such a complex document, and the conclusions are indeed on the alarmist side of the equation.

As you will see, later in the course, each report by the IPCC is immediately followed by a barrage of criticisms putting forth the viewpoint that the IPCC members are alarmists who play loose and free with the available data and draw unsupported conclusions. Charges of more sinister manipulations and eliminations of data are also common. Some of the critics are legitimate scientists trying to do science; others are working for fossil fuel industries or tied to political viewpoints with a climate-change-denier ax to grind. The IPCC critics tend to be on the conservative side of the political spectrum.

For a general reader, who doesn't have time to read the thousands of pages, claims, and counter claims, determining who is correct, determining the "truth" is next to impossible. But both sides make predictions. How things sort out will ultimately determine who was correct. By then, the IPCC supporters say, it will be too late to affect any change. It is also true to say that the continued process of "doing science" will also result, just as it did with tobacco, in a clarification about what is actually happening.

I am reminded of the population bomb argument of the 1970's put forth by Dr. Paul Ehrlich at Stanford and countered by Dr. Julian Simon of the University of Illinois. We will talk about this in more detail later, but here's a taste.

Ehrlich predicted eminent food shortages and mass starvation as population growth rapidly outstripped our ability to supply food. In other words, he argued that Malthus was right. Simon argued that technology would increase agricultural productivity and save the day.

In the near term of 40 years, Simon was correct. The Green Revolution, which we will also discuss, enabled agricultural production to dramatically increase, particularly in Asia. Eventually, though, Ehrlich will be correct, and as world population soars over 6 billion, and the Green Revolution runs out of tricks, that day would appear to be rapidly approaching.