

# Naomi Oreskes - Merchants of Doubt

Despite data being collected for over half a century, despite a President being warned about the looming threat of a changing climate in the mid 1960s, and despite plants and animals now changing their behaviour to fast altering conditions, a few scientists continue to raise doubts regarding climate science and its findings.

Naomi Oreskes sees a pattern. The pattern repeats itself in a string of issues including controversy over tobacco smoke, the dangers of acid rain, and DDT.

Naomi Oreskes tells the story in her book *Merchants of Doubt* and today on *The Science Show* we hear Naomi Oreskes in a public address at the University of NSW in 2010.

## Transcript

**Robyn Williams:** This is *The Science Show* on ABC Radio National, in which today we meet Naomi Oreskes from the University of California in San Diego. She's a historian of science and she's taken on a really perplexing puzzle - why did climate science, once accepted by most, and really rather mainstream in the public mind, suddenly become a matter of controversial debate, even a political hot potato? Professor Oreskes has a story to tell. It's in her book *Merchants of Doubt*, and it concerns watermelons, green on the outside, red within, and cigarettes, and Star Wars. Naomi Oreskes at the University of NSW.

**Naomi Oreskes:** Thank you so much, Robyn, for that generous introduction. So in 2005 my Austrian governor announced an initiative in California to commit the state of California to Kyoto level controls on greenhouse gas emissions. When he made this announcement he said, I say the debate is over, we know the science, we see the threat and we know the time for action is now. It's not every day you get to agree with a politician, but I did agree with my governor. Indeed, I thought he was correct, we did know the science and we did see the threat. And in the mid 2000s it seemed that the American people had gotten the message.

A poll done by the Yale Project on Climate Change working together with the Gallup polling organisation showed that in 2007, 72% of Americans were completely or mostly convinced that global warming was underway. Indeed, 62% of American citizens believed that life on earth would continue without major disruptions only if society took immediate and drastic action to reduce global warming.

Indeed, at that time it did seem as if the debate was over, and even many prominent contrarians had come around and were accepting the scientific evidence. So for example one of these was Frank Luntz, a Republican Party strategist. And in 2006 he said, it's now 2006. So he was off to a good start, he got the year right! I think most people would conclude that there is global warming taking place, and that the behaviour of humans are affecting the climate, still struggling with this syntax!

Luntz is important. He was famous, some might say infamous, because he was the author of a strategy memo for Republican candidates running for office in the United States in the mid-term elections that was leaked to the press, in which he advised Republican candidates not to use the phrase global warming, but to call it climate change instead. The reason, he explained, was because climate change is a lot less frightening than global warming. He argued that Republican candidates running for office should use scientific uncertainty as a political strategy, that they should emphasise the scientific uncertainty around the issues and insist that there was no scientific consensus. So he wrote, 'The scientific debate remains open, voters believe that there is no consensus about global warming within the scientific community. Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly. Therefore you need to continue to make the lack of scientific certainty a primary issue in the debate.'

So we see scientific uncertainty, the legitimate, real, normal uncertainty that's part of all scientific research, being turned into a political tool. Now Luntz's position was factually incorrect, the scientific debate was not still open. Indeed, in 2001 the Intergovernmental Panel on Climate Change had written

unequivocally, 'Human activities are modifying the concentration of atmospheric constituents that absorb or scatter radiant energy. Most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations.' So the IPCC said that in 2001. But in fact the science had actually coalesced earlier than that. In the second assessment report of the IPCC published in 1995, the scientists had written, 'The balance of evidence suggests a discernible human impact on global climate.'

In my own research as a historian of science, I was interested in the question of whether or not the IPCC reports were an accurate reflection of the rank and file of the scientific community. Did those summaries in the IPCC and in the US National Academy of Sciences and the Royal Society and many other scientific societies who had attempted to summarise the scientific work, were those summaries consistent with what was published in the rank and file, peer reviewed scientific journals?

So in 2003 I did an analysis of the scientific literature and found that through a random sample of 1,000 articles in the *ISI, Institute for Scientific Information* database, that in fact none of the articles dissented from that IPCC position. In fact, there was essentially unanimity in the scientific community that the balance of evidence did suggest a discernible impact, and that most of the observed warming was likely to have been due to greenhouse gas emissions. I published this in *Science Magazine* in 2004.

This result surprised many people, but it really should not have. It only surprised us because we had forgotten our own history. In 1992, 193 nations, including the United States and Australia, signed the UN Framework Convention on Climate Change, and when President George H. W. Bush signed the Framework Convention he called on world leaders to translate the written document into 'concrete action to protect the planet'.

I've interviewed a number of people who were involved in the UN Framework Convention on Climate Change, asked them about what happened between then and now. One of them was Gus Speth who served on the Council of Environmental Quality in the Carter administration in the United States, and he said, 'yes, we thought we were on track to make real changes.'

So what happened? What happened to this political consensus, this scientific consensus, that global warming was discernible? What happened to the UN Framework Convention on Climate Change?

So what I want to do tonight is to give a very brief overview of the evolution of climate science, when scientists understood these different important facts about our climate system, and then a brief history of the emergence of a political challenge to that science. It's a story of selling uncertainty to stave off government regulation and to protect the free market, as certain people understood it.

So for a historian of science, the beginning of the history of climate science could start probably most meaningfully with John Tyndall, who was the person who first established the concept of a greenhouse gas. So through a series of experiments in the 1850s, Tyndall showed that certain gases, particularly carbon dioxide and water vapour, had a very distinctive property of being highly transparent to visible light, but rather opaque to infrared. So water vapour and carbon dioxide in the earth's atmosphere allowed light to come in from the sun, but had a tendency to trap heat. Tyndall understood this is a very important fact about the earth, because without this natural greenhouse effect, the earth would be as cold as the moon or Mars and be a completely inhospitable place for life. So the natural greenhouse gas was basically a good thing.

The first person to suggest that changes in the greenhouse gas concentration could change the climate was this man Svante Arrhenius, a Swedish geochemist. Arrhenius was the first to suggest that by burning fossil fuels, mostly coal, we were adding additional carbon dioxide to the atmosphere above and beyond the natural CO<sub>2</sub> levels, and that this could change the climate through an increase in the absorption and trapping of heat in the atmosphere.

Arrhenius did the first calculations of the potential effect of doubling carbon dioxide, and calculated that doubling CO<sub>2</sub> would lead to an average global temperature increase of 1.5°C to 4.5°C centigrade. Arrhenius was Swedish, so he thought global warming would be a good thing! The first person to suggest that it might be a bad thing was Guy Stewart Callendar, a British steam engineer. In 1938,

Callendar was the first to suggest that global warming was actually possibly already underway. He compiled some of the early measurements of CO<sub>2</sub> in the atmosphere from mostly in Europe, and in a publication in the quarterly *Journal of the Royal Meteorological Society* suggested that temperature might in fact already be beginning to increase. That was in 1938.

In 1939 war broke out in Europe, Callendar became involved in war work, as did many other scientists in various different disciplines. The issue was not really revisited in a serious way until the 1950s, when it was taken up by a number of scientists in Europe, the United States and here in Australia, and most particularly by two men, Hans Seuss and Roger Revelle, both professors at my university, the University of California in San Diego.

In 1957, Suess and Revelle published an article in the peer review journal, *Tellus*, in which they suggested that mankind was performing a great geophysical experiment, by taking carbon dioxide that had been stored in rocks over the course of hundreds of millions of years of geological history, and returning a very significant amount of that carbon dioxide back to the atmosphere over the course of only a few decades. This argument was also made by a number of people including Bert Bolin in Sweden, who later would work on acid rain and also found the IPCC.

So Revelle's argument in 1957 was not that global warming was necessarily already underway, but that we needed to pay attention and track the issue. One of the most important ways to track it would be measuring the amount of carbon dioxide in the atmosphere to see if Callendar was correct, that it was actually already increasing. Through the International Geophysical Year in 1957-58, he obtained funding for the beginning of this project to measure carbon dioxide in the atmosphere.

The person who undertook that work beginning in 1958 was Charles David Keeling, who began the systematic measurement of carbon dioxide as part of the International Geophysical Year. This became Dave Keeling's life work. He continued it until he died just a few years ago. For this he won the National Medal of Science in the United States, awarded to him by President George W. Bush, and he produced what is now known as the Keeling Curve, which today is probably the single most reproduced time series data in the history of science.

What Keeling was able to show was that there was a systematic seasonal variability of carbon dioxide associated with photosynthesis, summer in the northern hemisphere where most of the land masses are, and by 1965 Keeling had already concluded that there was in fact a detectable increase in carbon dioxide in the atmosphere. This result led to the US President Science Advisory Committee writing a report with an appendix written by Revelle and Keeling, in which they made one of the early specific predictions of what the impact of increasing carbon dioxide might be. In 1965, they wrote, 'By the year 2000 there will be about 25% more CO<sub>2</sub> in our atmosphere than at present, and this will modify the heat balance of the atmosphere to such an extent that marked changes in climate could occur.' So that was in 1965.

Now it's often said that politicians never listen to scientists, but that's not always true. In this case, Keeling and Revelle's report landed on the desk of President Lyndon Johnson, and in 1965 in a special message to congress Lyndon Jonson declared, 'This generation has altered the composition of the atmosphere on a global scale through a steady increase in carbon dioxide from the burning of fossil fuels.' So if anyone says nobody knew, nobody could've know, we simply know that that's not true.

There's a lot of science that then begins to develop at this time, as the US government and other European governments and others begin to invest money in climate science research, but the most important is that this scientific insight coincides with the development of digital computing. By the late 1960s and early 1970s we see the rise of computer modelling and the construction of the first general circulation models, to model what happens to the atmosphere when you change the amount of greenhouse gases in it.

There was soon an emerging consensus in the expert community that given the rise of CO<sub>2</sub> that Keeling had documented, sooner or later warming would be expected to occur. This consensus was expressed by numerous different scientific bodies in many parts of the world. But one of the most concise summaries came from the US National Academy of Sciences in 1979, who wrote, 'a plethora of studies

from diverse sources indicates a consensus that climate changes will result from man's combustion of fossil fuels and changes in land use'.

This is a very interesting quote, because sceptics love to say that science is not about consensus. They like to quote Galileo saying that 'science advances by the work of heroic individuals', and of course sometimes that's true. Heroic individuals have played a role in the history of science. But it's interesting to me to see here the National Academy of Sciences using consensus as their word, their category, to summarise what it is that scientists believe they know at this moment in time. What they know is that climate changes will result, that this will happen, from man's using fossil fuels and changes in land use. We've also seen some sceptics complain that the scientific community has not paid enough attention to land use changes, but we see it right here in 1979.

**Robyn Williams:** You're listening to *The Science Show* on ABC Radio National, Professor Naomi Oreskes at the University of NSW.

**Naomi Oreskes:** So scientists had a consensus that global warming would occur, but what they did not have a consensus about is when this would happen. In fact, the when part of the question was quite contested, and there was a big difference of opinion among scientists right in the 1970s about how soon any of these changes might actually become detectable.

Most scientists writing in the 1970s thought that 'will result' meant perhaps by the year 2000 or even later. Figures like 2030, 2040, 2050 sometimes got bandied about. One scientist I interviewed who briefed the Carter administration on this issue in 1979 remembers being asked by an official in the White House, 'so when is all of this going to happen?' And one of the scientists said, 'well maybe in 40 years.' The White House official said, 'get back to me in 39!'

However, a few mavericks even then suggested that climate change might already be underway. One of these was John Perry, who was chief staff officer for the Climate Research Board at the US National Academy of Sciences. In 1981 he pointed out a very interesting idea. He wrote, 'Physically a doubling of CO<sub>2</sub> is no magic threshold. If we have good reason to believe that a 100% increase in carbon dioxide will produce significant impacts on climate, then we must have equally good reason to suspect that even the small increase we have already produced may have suddenly altered our climate.' I think this is a really important point, because we always talk about doubling CO<sub>2</sub>, and I think it does sometimes lead people to think it's almost as if nothing will happen until we get to the doubling. But of course we know that things are happening already now. So Perry concluded, 'Thus climate change is not a matter for the next century, we are most probably doing it right now.' That was in 1981.

So was Perry right? Were changes already happening? In 1982 Roger Revelle addressed the question in an article in *Scientific American*, and he wrote 'Models of the world's climate indicate that the answer is probably yes, but an unambiguous climate signal has not yet been detected.' Six years later, NASA climate modeller, James Hansen and his team, concluded that the signal had been detected. In work published in the *Journal of Geophysical Research* and also the *Proceedings of the National Academy of Sciences* and in testimony to the US Congress, James Hansen declared that he was 99% certain that climate change was indeed underway.

When Hansen made this statement in congressional testimony, a lot of climate scientists were uncomfortable. A lot of climate scientists thought he had gone too far, he was out on a limb. It wasn't really certain that climate change was underway. But nevertheless, scientists did agree that Hansen had a point, that there was something very important that needed more careful consideration. It was this emerging and disturbing evidence that led to the creation of the IPCC, the Intergovernmental Panel on Climate Change, in 1988. It also led *The New York Times* to say in August of 1988 that the issue of an overheating world has suddenly moved to the forefront of public concern.

Yet at the same time as the scientific understanding was beginning to coalesce, so we see was a politically motivated campaign to cast doubt upon it. So just as the science is beginning to come together, people like Hansen are saying we think this is actually discernible, and within a few years the IPCC would say the same, we also see the beginnings of the sceptical movement to challenge the science. The campaign focused on the claim that the science was unsettled and therefore it would be

premature for governments to act to do anything about it. It turns out that the origins of this claim can actually be traced back to a relatively small handful of people. So I'm a historian, I'm always interested in where things come from, how they developed, and so part of what Erik Conway and I tried to do in this book project is to trace these claims back to where they first came from.

Today, as you all know, there are attacks on climate science from many quarters in the United States, in Europe, there's a climate sceptic movement that's recently emerged in France, which is very shocking to French intellectuals who think they're above that sort of thing, and of course here in Australia, as you all know.

But one of the most important persistent and consistent voices going back to the late 1980s, challenging the scientific evidence, is the George C. Marshall Institute, a think tank in Washington DC. For many years, indeed for decades, they have either denied the reality of global warming or insisted that if there is warming it was not caused by human activities or, as they continue to today, insist that the scientific uncertainties are too great to warrant government regulation.

As recently as 2007 the Institute quoted Timothy Ball, a Canadian climatologist, arguing the widely propagated fact that humans are contributing to global warming is 'the greatest deception in the history of science'.

Today the Marshall Institute no longer denies the reality of manmade climate change, but they continue to cast doubt on climate science. So for example, as recently as last March, they had on their website, 'Many of the temperature data and computer models used to predict climate change are uncertain, as are our understandings of important interactions in the natural climate. Reducing these many uncertainties requires a significant shift in the way climate change research is carried out.' So you see them not denying the reality of climate change anymore. That really can't be done with a straight face, but focusing on the uncertainties, emphasising the uncertainties and implying that there's something wrong with climate science, because there are all of these residual uncertainties.

So where did the Marshall Institute come from? And why do they promote doubt about climate science? Well the Marshall Institute was founded in 1984 by three men. They were all physicists and they were all physicists who had built their careers in Cold War weapons and rocketry programs. They'd worked on the atomic bomb, the hydrogen bomb and rocketry and other nuclear weapons delivery systems. Robert Jastrow was an astrophysicist who was the head of the Goddard Institute for Space Studies, very active in the American space program, active in the Apollo program and other rocketry programs. This man, William Nierenberg, a nuclear physicist who had begun his career on the Manhattan Project working on isotope separation and the long time director of the Scripps Institution of Oceanography where he supervised and sponsored many Navy sponsored oceanographic research projects associated with submarine detection, acoustic detection of Soviet submarines and the accurate guidance of submarines launched into continental ballistic missiles. Fred Seitz, also a physicist, a solid state physicist who had worked with Eugene Wigner, one of the fathers of the atomic bomb, and at one time the president of the US National Academy of Sciences. So these were all extremely distinguished men, all extremely successful, and all heads of major scientific research institutes in the United States of America.

These men had known each other throughout their career. Both Seitz and Nierenberg had served as science advisor to NATO. They had been on various advisory committees together. In the 1980s, they found themselves working together on an advisory panel to the Reagan administration on the question of strategic defence, or what most of us know of as Star Wars, the idea of a missile shield to protect the United States from incoming intercontinental ballistic missiles.

In 1984 they created the Marshall Institute to defend strategic defence against a boycott of it by US scientists. Strategic defence was highly controversial, both in the United States and elsewhere, because it was a departure from the long established Cold War doctrine of mutual assured destruction. The vast majority of scientists who had worked on nuclear weapons programs argued that strategic defence was not feasible, that to build a perfect impermeable missile shield was simply not technologically feasible. But even if it were, in a way that would be worse, because it would be politically destabilising, because if you thought you had an effective missile shield, then you might be tempted to launch a first strike,

thinking that you would be immune from retaliation. So for this reason, many scientists who had worked quite happily on weapon systems during the '60s, '70s and '80s, refused to work on strategic defence. 6,500 American scientists and engineers signed a petition declaring a boycott of strategic defence program funds. This was unprecedented in the history of the Cold War. During the Cold War there had been numerous individual scientists who sometimes for personal reasons declined to work on particular weapon systems, but there had never been a wholesale rejection of a nuclear weapons program by American scientists.

This greatly disturbed the Reagan administration and it greatly disturbed Seitz, Nierenberg and Jastrow, who supported SDI and who argued against the majority of their technical colleagues that SDI was feasible, that it could be made to work, and moreover that it was necessary and even urgent. Between 1984 and 1989, Jastrow, Seitz and Nierenberg worked to defend SDI by promoting an alarming view of Soviet strength and a very frightening picture of American military weakness. They wrote numerous articles, opinion pieces, white papers, defending SDI and claiming that the Soviet Union was overtaking the United States in military and technical superiority. I don't have time to give you all the examples of the sort of things they did, but here's my favourite, this article published in *The National Review*, 'American has five years left!' Sceptics like to claim that climate scientists are alarmists, but you see that actually that shoe is on the other foot. Of course, this is a great piece of work, because notice the year, 1987. What happens in 1989? Yes, the Berlin Wall falls and the Soviet Block begins to disintegrate. So we know in hindsight that these claims were actually incorrect. America did not have five years left, it was actually the Soviet Union that had less than five years left.

Now, here's where the story gets really interesting. So Frederick Seitz, who was the founding chairman of the board of the Marshall Institute, was a nuclear physicist. But in 1979, he took a new job in his retirement. He had retired from his work as a physicist and went to work for the R. J. Reynolds Tobacco Corporation as a consultant, directing a biomedical research program in which he distributed over \$45 million to scientists doing research that could cast doubt on the science that established the harms of tobacco.

We know from the research of other scholars that one of the principle strategies of the tobacco industry, to defend tobacco against the scientific evidence of its harms, was doubt-mongering, to insist that the science was unsettled, that we didn't really know for sure if tobacco was really dangerous, that we couldn't explain all the mechanisms, that there were a lot of uncertainties. How come two sisters could both smoke a pack a day, one gets cancer, the other doesn't? Therefore, because of these uncertainties, that it would be premature for the government to intervene to regulate tobacco use.

In 1989 these two stories merged. The Cold War ended and the Soviet enemy began to disintegrate. The west had won the Cold War, and you might have thought that these old Cold Warriors would be happy, that they would be satisfied that their life's work had come to such a positive fruition. They might have rested content, but they didn't. It's kind of like old generals who can't stop fighting the last war.

What we see is that they find a new enemy. This new enemy is what they called environmental extremism, what they considered to be an exaggeration of environmental threats by people with an alleged left wing agenda. So they begin to see reds under the bed, and the bed is environmentalism. Following on the lessons that Frederick Seitz had learned working for the tobacco industry, they apply the tobacco strategy - doubt-mongering. They begin to insist that the science is unsettled, that we don't really know and that there isn't a consensus among the scientific experts.

'Doubt is our product' ran the infamous memo written by one tobacco industry executive in 1969, 'since it is the best means of competing with the body of fact that exists in the minds of the general public.' Now this is an incredibly important memo. It's been reproduced by many scholars in many different contexts, and it was a crucial piece of evidence in the US federal prosecution of the tobacco industry, because it showed that the tobacco industry deliberately worked together, conspired, the tobacco industry was found guilty of conspiracy under the Racketeering and Corrupt Organisations Act, because of documents like this that showed that the tobacco industry consciously set out to challenge the scientific evidence by manufacturing doubt.

But one of the key insights the tobacco industry realised early on was that for this doubt-mongering campaign to be credible, for it to be effective for journalists who'd quote them, it wouldn't do for tobacco industry executives to get up and say, we don't really know if tobacco is harmful. Most of us would realise that that didn't pass the laugh test. But if the tobacco industry could get scientists to say it, and particularly if they could get distinguished scientists, prestigious scientists, a president of the US National Academy of Sciences to say it, well that would have a lot of credibility. In particular, the documents show that the tobacco industry understood that it would have credibility with the media, and that people like Robyn might not quote a tobacco industry executive, but they would quote the president of the US National Academy of Sciences. So a key component of this strategy was the recruitment of scientists, was finding scientists who would be willing to participate in this activity.

So in our book, in our story, we show how this tobacco strategy then spreads to a whole set of other environmental issues, and how we see scientists then supplying doubt, exaggerating doubt, emphasising doubt, amplifying doubt, about the reality of acid rain, the severity of the ozone hole and of course the human causes of global warming. We also in the book describe a kind of rearguard action in recent years to revisit the scientific evidence of the harms of DDT and to claim that DDT should never have been banned in the first place.

**Robyn Williams:** Professor Naomi Oreskes, author of *Merchants of Doubt* is speaking at the University of NSW. You're listening to *The Science Show*.

**Naomi Oreskes:** In every one of these cases, we see this small group of physicists denying the severity of these problems. In every single case, the same pattern, over and over and over again, to insist that the science was too uncertain to justify government action. It involves the systematic misrepresentation of the actual scientific evidence, just as the tobacco industry did before. When we were writing the book, one of the shocking things to us was to see how, you know, fool me once, shame on you; fool me twice, shame on me. It's like fool me 17 times! The same thing over and over again. Yet, because it's a seemingly different issue with different scientists, different journalists, people don't see the pattern. They don't see the pattern.

But here's what the pattern was - cherry-picking data, so individual pieces of evidence that didn't seem to support the mainstream view, take those bits of evidence out of context, amplify them, make a big fuss. So find one glacier in New Zealand that isn't retreating and insist that there's no global warming, making personal attacks on leading scientists, like stealing private emails, we've seen a lot of this in the last year, but this has been going on since the 1980s, pressuring journalists to write balanced stories, giving equal weight to the industry position, even though that position is not supported by scientific evidence. Then finally finding a tiny handful of dissenting scientists, three physicists in America, two geologists in Australia, one climate scientist in New Zealand, and then vigorously promoting them on television, radio and in print media, to create the impression of real scientific debate, when the actual scientific community is in agreement about these issues.

So what I want to talk about is why they did it. Why would distinguished scientists misrepresent scientific evidence? Why would distinguished scientists like a president of the US National Academy of Sciences attack his own scientific colleagues, misrepresent their work, launch personal attacks on them, accuse them of fraud? Why would a scientist do that to his fellow scientists? Well his, it's always his I have to say, it's a different story!

Everyone always assumes this must be a story of corruption for money, and in fact it's actually more complicated than that. We never found any evidence that Fred Seitz, Bill Nierenberg, Robert Jastrow did any of this for personal monetary gain. Rather, what we really see is that it's ideological and that it's driven by the ideology that George Soros has given the title 'free market fundamentalism'. Free market fundamentalism is really a kind of end member of a wide spectrum of beliefs that can be broadly categorised as modern neoliberalism. This is a set of beliefs that are focused on the value of deregulation and releasing the so-called magic of the marketplace. It came to prominence in the early 1980s, and this is not a coincidence, so one of the interesting things about this story is that the scientific evidence of global warming is coalescing just as a political consensus is moving towards deregulation. So this is a historical contingency that has very, very great political and social consequences. So it comes to prominence in the early 1980s under Margaret Thatcher in the United Kingdom, Ronald

Reagan in the United States, but it continues through the 1990s, you saw it here in Australia under the John Howard administration.

But its intellectual roots are much earlier. They're to be found in the ideology of two key thinkers, Milton Friedman, the American economist and founder of the Chicago School of Economics, and Friedrich Hayek, the Austrian economist considered one of the founders of modern neoliberalism. So what is this crucial argument of neoliberal ideology? Milton Friedman's most important book was a work called *Capitalism and Freedom* published in 1962, right at the coldest moment of the Cold War, at the time of the Cuban missile crisis. Friedman's argument was really encapsulated by his title, and it's an argument against communism and in favour of capitalism. His argument is that civic freedom and free markets are inextricably linked, because if a state wants to control markets through centralised planning, the only way you can control markets is to control the people who act in those markets. Therefore it's inevitable that if you abandon free markets, you will abandon freedom more generally, and you'd be on a slippery slope to tyranny, to Soviet style communism.

In *Capitalism and Freedom*, Friedman credits his inspiration to Friedrich Hayek. Hayek was an Austrian economist who fled Austria after the Anschluss and went to the United Kingdom where he became a professor at the London School of Economics. He believed that Austrian fascism had arisen in response to the failures of socialism, and he became a passion opponent, not only of Soviet style communism, but of Western European social democracy as well, arguing that it would put us on the road to serfdom, that today you lose your economic freedom, tomorrow you lose your civic, political or religious freedom.

The contrarians in our story took this argument even further and argued that environmentalism was the slippery slope to socialism. Why? Because environmentalists almost invariably argued for regulation. Whether it was acid rain, the ozone hole or second-hand smoke, all of these things seemed to imply that the government needed to step in to do something to protect people from these harms, from the negative externalities. They argued that it was only a small step from the regulation of acid rain or second-hand smoke towards government control of our lives more broadly.

These ideas were articulated in various places, but most clearly by a fourth scientist who joined this cause, and that was Fred Singer, the *boite noire* of many climate scientists, who continues today to attack climate science. Like the others, Singer's biography was remarkably close to the other three. He was also a Cold War physicist, in fact he was the proverbial rocket scientist. He had worked on the early satellite rocketry programs in the 1950s and was the first director of the US National Weather Satellite Service. He often claims to be a climate scientist because of this connection to the weather service, but he was the director of the weather service not in his capacity as a climate scientist, which he was not, but as a rocket scientist who knew how to get those satellites up into space.

In the 1980s, Singer worked with the Reagan administration to cast doubt on the significance and severity of acid rain, arguing that controlling sulphur emissions was a billion dollar solution to a million dollar problem, so implying that environmentalists had exaggerated the significance of acid rain, and it wouldn't be significant enough to justify what it would cost to fix. So this is an argument we hear again today regarding global warming.

In the 1990s he teamed up with Fred Seitz and Bill Nierenberg to cast doubt on the scientific consensus of the ozone hole and the evidence of the harms of global warming. I mentioned already that from 1979 to 1985 Fred Seitz had worked with the R. J. Reynolds Tobacco Company, and similarly in the early 1990s we see Fred Singer joining forces with the Philip Morris Tobacco Company, to defend tobacco in the form of second-hand smoke. This defence took the form of offence. It took the form of an attack on the US Environmental Protection Agency. In 1993 Fred Singer teamed up with a lawyer named Kent Jeffrey and wrote a report called *EPA and the Science of Environmental Tobacco Smoke*. This is one of the delicious ironies in the story and one of the few places that the tobacco industry made a serious tactical error.

So the tobacco industry didn't like the term 'second-hand smoke', because they reasoned that Americans didn't like second-hand things! So they decided that they would promote a different term and they would call it environmental tobacco smoke, which they thought sounded a lot less frightening

and a lot more congenial. The only problem was that if it was environmental tobacco smoke, then it invited the scrutiny of the Environmental Protection Agency, and that of course is exactly what happened. So Singer and Jeffreys wrote a report attacking the EPA over this question. The report was published by an institute called the Alexis de Tocqueville Institute, but with funding from the tobacco industry.

Why were they attacking the EPA? The EPA had reviewed the scientific evidence and concluded that second-hand smoke was a class A or proven carcinogen. This result was affirmed by the US Surgeon General and by many studies in Europe, Japan and elsewhere. An independent expert panel reviewed the scientific evidence from the United States, Germany and Japan and concluded that second-hand smoke was responsible for 3,000 additional adult cancer deaths each year in the United States alone, with many more in other countries, and as many as 300,000 additional cases of bronchitis and pneumonia in infants and young children. They also concluded that second-hand smoke was correlated with an increase in Sudden Infant Death Syndrome, also known as cot death.

This evidence was supported by diverse independent studies from the United States and elsewhere. So why would a rocket scientist challenge it? Indeed, why would anyone defend a product that killed infants in their cribs? Well, Fred Singer explained why. On page two of his report he wrote, 'If we do not carefully delineate the government's role in regulating dangers, there is essentially no limit to how much government can ultimately control our lives.' So there is it. There's the road to serfdom argument, the slippery slope. If we protect babies from second-hand smoke, then ultimately the government can control everything.

So it's this worry, this anxiety, this fear, that leads to the suspicion, even the allegation, that environmentalists are really socialists in disguise. As Robyn quoted from *The Times Review*, this allegation that environmentalists are watermelons! George Will, the columnist for *The Washington Post*, has accused environmentalism of being a dream tree with red roots. And as many of you know, the US senator, James Inhofe, a senator from Oklahoma, has threatened to indict climate scientists for conspiracy to lie to congress, and accused them of being part of a conspiracy to bring down global capitalism, to which I respond, scientists should be so organised!

Throughout their writings, we see contrarians asserting or implying by innuendo, or sometimes overtly, that environmentalists and by implication the scientists working on environmental issues have a hidden socialist agenda. Fred Singer said this explicitly in an article he wrote in 1989 about the ozone hole, in which he wrote, 'And then there are probably those with hidden agendas of their own, not just to save the environment, but to change our economic system. Some of these coercive utopians are socialists, some are technology-hating luddites, and most have a great desire to regulate on as large a scale as possible.' So even this assertion that environmentalists want regulation, that they love regulation, that they seek regulation, it's this conviction that environmentalism is actually a rearguard attack on freedom, a kind of hidden reds under the beds, that helps to explain the origins of the story in strategic defence, helps to explain who these people were, why they were all Cold Warriors who had dedicated their lives to protecting the free world. They were men who saw the defence of the free world and therefore free markets as an extension of their life work. It also explains one additional key part of the story that links this rather American story to the rest of the world, and that's the promotion of this doubt-mongering campaign by think tanks promoting free enterprise, supported in turn by major corporations for who money is at stake. So here we see then the financial interests making an alliance with this ideologically driven program.

So if we go back for a moment to Fred Singer and Kent Jeffreys' 1993 report, we notice that it's published by the Alexis de Tocqueville Institute. So who are the Alexis de Tocqueville Institute? Well, they're a think tank whose goal is 'the extension and perfection of democracy and economic liberty and political freedom'. So here we have again this assertion or assumption that economic liberty and political liberty go hand in hand. In practice though, if we ask how does the Alexis de Tocqueville Institute try to promote liberty, the answer is through lower taxation and less regulation of industry. Who was Kent Jeffreys, this co-author? It turns out he was a lawyer affiliated with the Cato Institute and the Competitive Enterprise Institute. What is the Cato Institute? A think tank dedicated to individual liberty, limited government and free markets. The Competitive Enterprise Institute? To expanding liberty, increasing individual opportunity and strengthening free markets. Free markets, free markets, free markets.

So this story begins in the 1980s, it begins in the Cold War, it begins with SDI. But by the 1990s we see it expanding. In response to the UN Framework Convention on Climate Change and the Kyoto Protocol, we see the growth of a network of think tanks and organisations spreading doubt about climate science. So it begins with the Marshall Institute and this rather small group of people, but then it begins to spread very, very widely. The list of different think tanks and institutes, I've counted at least 20 or 30, but the most important ones, the Alexis de Tocqueville Institute, the Cato Institute, the American Enterprise Institute, the Competitive Enterprise Institute, the Hartland Institute, the Acton Institute, Frontiers of Freedom, Committee for a Constructive Tomorrow, it goes on and on and on. Some of these organisations like the Competitive Enterprise and the Hartland Institutes have been active here in Australia. In addition here in Australia you have the Institute for Public Affairs, who have also been extremely active in promoting doubt about climate change, linked to an agenda of promoting free markets, less regulation.

So all of these groups promote freedom, all of these groups promote liberty. Who could disagree with that? But if we ask the question who funds these groups and who do they really represent, then what we find is that they're funded by regulated industries, regulated industries that produce products that have serious negative consequences that are not addressed by the free market, what economists call the negative externalities, the consequences that are not reflected in the market price. So we have at the very beginning of this story the tobacco industry, the fossil fuel industry, the mining industry, the chemical industry. In addition, we see funding for these think tanks coming from libertarian foundations. Most of these, with the exception of Coors who made his money on beer, if you ask where did the money from these foundations come from originally, all of them have roots in the fossil fuel industry.

So we see the fossil fuel industry channelling money into non-profit, non-partisan foundations who give money to these think tanks who claim to be neutral policy think tanks, but all of whom have roots that connect back to regulated industries. What of this allegation that environmentalism is actually socialism in disguise? We know something about the origins of the modern environmental movement. In the United States, at least the origins of the environmental movement are not to be found in left wing politics, but rather in the progressive Republicanism of US President Teddy Roosevelt and Gifford Pinchot, who was the first director of the US Forest Service, and of course that famous communist, John D. Rockefeller. Throughout the 1950s and 1960s in the United States there was a bipartisan consensus on the importance of protecting the environment, such to the extent that when the Wilderness Act of 1964 designated over 9 million acres of Americans lands as areas where man himself is a visitor and does not remain, it passed the United States senate by a vote of 73 to 12, and the US House of Representatives by a vote of 373 to 1.

In the 1970s the US Environmental Protection Agency was created by Republican President Richard Nixon, who signed into law many key pieces of environmental legislation, including the Clean Air Act Extension, the Clean Water Act, the Endangered Species Act, the Marine Mammal Protection Act, the National Environmental Policy Act, all key signature pieces of environmental legislation that remain the framework of environmental protection in the United States today, all passed under a Republican president, a bipartisan consensus of both Republicans and Democrats in the United States. It's interesting, because these laws, in particular NEPA, became the model for similar laws in Europe and Australia. When I worked here in Australia in the early 1980s, I worked on the environmental impact statement for the Roxby Downs copper, uranium, gold mine, and everything we did for that environmental impact statement was modelled on the US National Environmental Protection Act.

But things began to change in the 1980s. This is the historical contingency at the heart of this problem, and in a way at the heart of what I consider to be almost the tragedy of global warming, that scientists in the 1980s, not socialists, but scientists discovered a set of serious problems: acid rain, the ozone hole, global warming, that were not amenable to local solutions, problems that couldn't just be solved by local governments or states or individuals acting on their own, problems that seemed to require national or even international cooperation.

These issues emerged scientifically just as the Reagan administration in the United States and the Thatcher administration in the United Kingdom were arguing for less government, less regulation and also less internationalism. It put the Reagan administration and later much of the Republican Party on a collision course with science.

Now of course the environmental movement has changed quite a bit since the days of John D. Rockefeller, and some environmentalists may be socialists. But it doesn't mean the science is wrong. It doesn't mean that DDT and acid rain and the ozone hole and second-hand smoke weren't real problems that needed real solutions, problems that don't go away by denying them. It certainly does not justify the misrepresentation of science or shameless personal attacks on scientists. Moreover, the claims that are often made about what would happen if we did regulate these markets, these claims have been shown by history to be incorrect, so we actually know something about what emissions trading systems look like, because in the United States we implemented emissions trading in the 1980s in Southern California to control air pollution, and in the 1990s in the industrial mid west to prevent acid precipitation in the United States and Canada.

In the 1990s when the US government instituted a cap-and-trade system to prevent acid precipitation, acid emissions fell as they were intended to do, and electricity prices fell, as utilities put a new and better technology that actually worked more efficiently and caused the operating costs to fall. People in the mid west of the United States did not find themselves with noticeably less liberty than other US citizens. Moreover, we've learned a few things since 1962 as well. The fact is that Friedrich Hayek was wrong about the road to serfdom. Among other things, he predicted that if the Labour Party came to power in the United Kingdom and instituted social democracy, it would lead to fascism. But it didn't lead to fascism. It led to a lot of other things, like bad coffee! Indeed, virtually every major European country after World War II, England, France, Germany, Sweden, Norway, Denmark, The Netherlands, all instituted some form of social democracy, and none of them became fascistic. On the contrary, these countries all became more egalitarian and more democratic than they had been before the war. And Milton Friedman was wrong about the inextricable link between economic and political freedom. Just think about the recent histories of Chile and China.

In Chile in the 1970s, Augusto Pinochet overthrew a democratically elected socialist government and instituted a capitalist dictatorship. We have had capitalist dictatorships. Capitalism does not automatically lead to democracy. In China today, we have a new form of government emerging, a previous unimagined form of communistic capitalism, for which we don't even have a term, but recently *The Economist* magazine referred to it as market authoritarianism. In England, where capitalism was invented, in the 19th century England prohibited the emigration of skilled workers. And what about the long history of slavery in the United States?

So the slippery slope to socialism just isn't true. History shows us that the relationships between political and economic freedom are complex and diverse. There have been oppressive capitalist governments. There have been relatively liberal socialist and social democratic governments. These relationships are complicated and cannot be simplified as simply a road to serfdom. We also know from history as well as from recent events, from Wall Street to the Gulf of Mexico, that free markets require regulation and enforcement to exist as free markets and to prevent unavoidable costs to bystanders, the costs that accrue to people who do not reap the benefits of these activities. Of course, global warming is one of the ultimate examples of a negative externality, that wealthy nations like the United States, Canada, Western Europe and Australia have reaped the benefits of burning fossil fuels, but many of the adverse impacts of climate change are already beginning to be felt by island nations and other people who do not benefit from the burning of fossil fuels that we undertook.

Of course, there's a profound irony at the heart of this story, because while we have delayed acting on global warming, the problem has gotten steadily worse. Many scientists now think we are reaching, or perhaps have even passed crucial tipping points that could lead to true crises like the breakup of West Antarctica that would lead to metres rather than centimetres of sea level rise. The longer we wait, the more we increase the likelihood that we will need intrusive government action to prevent such catastrophes. So by fostering delay, the merchants of doubt have made it more likely that the very thing they most dreaded will actually occur.

I would submit that no-one is an advocate of intrusive government. But as the philosopher Isaiah Berlin pointed out, liberty for wolves does mean death to sheep. I'm in Australia, so I guess I should say dingoes! But all societies accept some limitations on the actions of others, because without such limits there would be no civil society. We do regulate behaviour and we do it to protect people from negative externalities, from unintended consequences, from unacceptable costs to bystanders. We create those limits based on our judgement of the potential harms and risks, based on our judgement of what those

negative externalities are. This is why it is so important for us to understand the science, because it's the science that tells us what is happening and what is likely to happen if we don't do something to control greenhouse gases. It is the science that explains the risks and the harms that we face. It's for that reason that it is the science that has come under such virulent attack.

So to conclude, in 1990 Richard Darman, the director of the Office of Management and Budget under President George H. W. Bush, dismissed the concerns of environmentalists derisively, saying Americans did not fight and win the wars of the 20th century to make the world safe for green vegetables. We didn't make the world safe for green vegetables, nor for polar bears, nor for Pacific Islanders, and if we don't do something pretty soon, it may not be safe for us either.

**Robyn Williams:** You've been listening to Professor Naomi Oreskes from the University of California, San Diego. Her book is called *Merchants of Doubt*, and it's published here by Bloomsbury Press. She was speaking at the University of NSW.

## Guests

### Naomi Oreskes

Professor of history and science studies  
University of California  
San Deigo California USA  
<http://sciencestudies.ucsd.edu/Faculty/oreskes.html>

## Publications

Title: *Merchants of Doubt*  
Author: Naomi Oreskes and Erik M. Conway  
Publisher: Bloomsbury Press  
URL: [http://www.bloomsburypress.com/books/catalog/merchants\\_of\\_doubt\\_hc\\_104](http://www.bloomsburypress.com/books/catalog/merchants_of_doubt_hc_104)

## Presenter

Robyn Williams

## Producer

David Fisher

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