

## 8. Influences on a changed story and the new normal: scientists' beliefs and public scepticism

*Sceptics—look at their track record; for an important group of sceptics their primary qualification is geology; in this argument, that offers red herrings and doesn't help the policy process.*

Geoff Love, Director, (Australian) Bureau of Meteorology, speaking at the 5th world conference of science journalists, Melbourne, 18 April 2007

*Climate scientists are a very small cabal that actually don't study climate change, they study weather change ... but the expert group of scientists on climate change ... is the people you've just referred to, geologists.*

Bob Carter, marine geologist, speaking on *Mornings with Paul Murray*, 6PR, Perth, 11 March 2011; quoted on *ABC Media watch*, 21 March 2011

Scientists too have values and beliefs. The world views of different scientific disciplines can significantly influence science and society discussions like climate change.

Different disciplinary groups act like academic tribes, with their own set of intellectual values and their own patch of cognitive territory (Becher 1994). Armed with this understanding, it's easier to grasp the challenges faced by the sprawling, multi-disciplinary task of unravelling climate change and also understand where some of the staunchest sceptics have come from. Climate science has required that scientists from a wide range of earth and environmental sciences learn to cooperate, and to accept each others' data, often for the first time, to affect the progress that has been made.

Policy gridlock is not unusual for controversial environmental science research. A recent report looked at the interaction of disciplinary differences with social values and 'normative lenses' (i.e., what a discipline considers *should* be the case) and found:

In areas as diverse as climate change, nuclear waste disposal, endangered species and biodiversity ... and agricultural biotechnology, the growth of considerable bodies of scientific knowledge, created especially to resolve political dispute and for effective decision-making, has often been accompanied instead by growing political controversy and gridlock. Science typically lies at the centre of the debate, where those who

advocate some line of action are likely to claim a scientific justification for their position, while those opposing the action will either invoke scientific uncertainty or competing scientific results to support their opposition. (Sarewitz 2004: 386)

So it's worth taking a closer look at the beliefs of several disciplines that have been at the forefront of sceptical debate about anthropogenic climate change.

Whether or not one calls economics a science, its normative (i.e., what *should be*) assumptions and theories have exerted a significant influence on the public discussion and on political attitudes towards climate science in recent decades. Several other disciplines feature prominently as well. Many of Australia's most oft-quoted climate change sceptics, with seemingly relevant scientific credentials, are either geologists—for example Bob Carter (James Cook University), Ian Plimer (University of Adelaide and mining company director)—or they are meteorologists or climatologists, particularly William Kininmonth (former administrator of the Bureau of Meteorology's (BOM) National Climate Centre) and, for a while, Brian Tucker (after leaving the CSIRO Division of Atmospheric Research, which he headed at the time).<sup>1</sup>

The term 'sceptic' (or 'denier' or 'contrarian') is a common label for those who reject the Intergovernmental Panel on Climate Change (IPCC) assessments on anthropogenic climate change or deny human agency in the phenomenon. While I use the term sceptic, as defined above, I concede that this use is problematical for scientists, who would typically characterise themselves as sceptical by training and inclination.

Disciplinary differences help explain the tenacity of some sceptics who are not necessarily linked to corporate special interests and whose continuing public debate in the face of overwhelming evidence may appear puzzling. While the general public and many journalists may think that anyone called a climatologist or a meteorologist or geologist must be an expert on climate change, and some may be, the disciplinary assumptions of these professions, particularly from training dating back 30–50 years or more, are different from that of today's specialised atmospheric and climate scientists.

Eminent biologist Peter Doherty notes that the complexity of modern interdisciplinary science, which collates a huge amount of interrelated data from

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1 Two of the leading 1990s US sceptics invited to Australia, Patrick Michaels and Robert Balling, were climatologists by training or employment (*Sourcewatch*). Displaying their own disciplinary perspectives, statisticians like Ian Castles and Bjorn Lomborg have entered the debate with a sceptical point of view. Clive Hamilton in his book *Scorcher* (2007) discusses the Australian sceptics, as does the website *Sourcewatch* which provides backgrounds on prominent sceptics.

various disciplines, has left 'a few old geology and meteorology practitioners, in particular, very uncomfortable with this process and [they] over-state the case that their "historical knowledge" is being ignored' (Doherty 2009: 9).

Geologists, climatologists and meteorologists have been taught that past or present conditions are the only valid predictors of weather, climate or future planetary situations. In this view, modelling data of future events can always be attacked as weak and unsubstantiated. These disciplinary backgrounds would incline the practitioners to promote a natural variation explanation and reject human activities as causing climate change phenomena.

## **'Balance of nature' global change and geology**

A detailed history of the discovery of global warming/climate change by US physicist and science historian Spencer Weart shows that, until recently, those studying earth processes held an implicit belief that there is a 'balance of nature' that would correct any disturbances created by human activity. Indeed, a central idea was that human activity is insignificant against the great planetary forces that shape and reshape our world.

Calculations made since the late 1800s about the heat-holding significance of a rise in CO<sub>2</sub> levels in the atmosphere drew arguments that there exist compensating or balancing mechanisms, such as increased cloud formation. Weart commented:

These objections conformed to a view of the natural world that was so widespread that most people thought of it as plain common sense. In this view the way cloudiness rose or fell to stabilize temperature, or the way oceans maintained a fixed level of gases in the atmosphere were examples of a universal principle: the Balance of Nature. Hardly anyone imagined that human actions, so puny among the vast natural powers, could upset the balance that governed the planet as a whole .... This view of nature—suprahuman, benevolent and inherently stable—lay deep in most human cultures. It was traditionally tied up with a religious faith in the God-given order of the universe. (Weart 2004: 8–9)<sup>2</sup>

While by the mid 20th century everyone also knew that there could be pivotal global changes such as ice ages—in fact the exploration of ice ages started

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2 Lynn White Jr's seminal 1960s study *The historical roots of our ecologic crisis* set the stage for environmental history studies that acknowledged the ingrained Christian beliefs in Western culture about the roles of God, humans and nature.

climate change studies—the assumption was that this only happened on vast timescales, not on human time scales. So it was believed there was no immediate worry about any potential climatic changes.

Geologists were at the forefront of mapping out the ice ages, which brought them into climate studies, and their basic disciplinary assumptions conformed to the so-called ‘uniformitarian principle’—that the present is always representative of the past. ‘The principle was cherished by geologists as the very foundation of their science, for how could you study anything scientifically unless the rules stayed the same?’ (Weart 2004: 9–10)

It is not surprising, then, to learn that Ian Plimer appeared on the fundamentalist free market Institute of Public Affairs (IPA) website in 2007 with a review article entitled *The past is the key to the present: greenhouse and icehouse over time* (Plimer 2007).

The firm belief that answers can only be derived from on-ground review of past earth history may have stemmed from a painful dispute among geologists that disengaged them from the ‘catastrophist’ legends of global change preserved in religious traditions, such as Noah’s flood. Given this background, geologists were not about to entertain new theories of rapid, catastrophic change without a battle.

Science historian Naomi Oreskes provides a fascinating history of geological disputes over continental drift. Uniformitarianism was the geologists’ answer to dealing with physical evidence balanced against the ‘eighteenth century association, particularly in England, of geology with theology in general and with scriptural exegesis in particular’. Given this background, sudden or dramatic change, ‘unaccounted for by the normal processes of daily geological life were all too close to miracles for most geologists’ comfort’ (Oreskes 1999: 204). At the same time, many scientists, like other members of society, privately retained a view that the world was governed by a ‘normal’ God-given order.

## **Normality and consistency: the bedrock of weather reporting**

Beliefs in normality and consistency also pervaded the fields of climatology and meteorology. If one thinks about how the weather is still reported, even in a country as manifestly variable as Australia, it is in deviations from some hypothetical or statistical norm.

The science of climatology has traditionally been based on averaging seasonal temperatures and rainfall in the belief that statistics of the past 100 years, since

records began, could reliably predict future decades. In this view, 'climate' equals a set of weather data averaged over the ups and downs. Principal clients have been farmers and engineers, who needed statistics to decide on crop plantings and to prepare for 100-year floods. While climatologists predicted seasons, meteorologists were using similar means to look at the next day's weather by looking at the recent past.

All three of these disciplines had developed a culture of relatively narrow, on-ground measuring and comparison that viewed modelling and theorising outside the box as problematic territory (Weart 2004). Brian Tucker, on retirement from the CSIRO, provided sceptical analyses for the IPA as a senior research fellow emphasising uncertainty and caution. In a letter following an interview he wrote: 'although perceptions of possible climate change depend almost entirely on numerical climate modelling, model results are generally accepted uncritically, with little cognizance given to the weaknesses inherent in model specifications, the mathematics used and the poor precision of model results.'

Tucker and other scientists sceptical of the science and policy debate over climate change have not appeared as ready to apply similar criticisms to economic modelling and its assumptions. Thus, in a critical piece written for the IPA, Tucker quoted at length from an economic analysis produced for the Electricity Supply Association of Australia in August 1994. This analysis predicted 50 and 60 per cent increases in energy prices and the elimination of the aluminium industry if the 1990 interim national emission reduction target of more than 20 per cent by the year 2000 went ahead. This economic modelling was accepted at face value, while climate science based on modelling was uncertain. In any case, it was Tucker's view that any impacts would occur slowly over centuries and that the policy response, therefore, verged on unnecessary panic that would just hurt the economy (Tucker 1994).

In Australia, the influence of these disciplinary positions can be seen also in the relative absence of the Bureau of Meteorology (BOM) from the evidence on the public record during the 1990s and the eventual emergence of Kininmonth as a prominent sceptic following his retirement. John Zillman, director of BOM from 1978 to 2003 was engaged with climate science policy advice to government, but the record indicates that this was mainly confined to acting through the processes of the World Meteorological Organisation and the IPCC. He was described as 'quite conservative' about climate science in a detailed 2004 article on the Australian sceptics and the Lavoisier Group (Fyfe 2004). The article quotes him as saying he is now convinced of the mainstream science of climate change and human agency, although he would not have been '10 years ago'—that is, in the mid-1990s.

Zillman's former colleague Kininmonth became active after his retirement in 1998 and promoted the view that climate change is a purely natural variation that takes place over long time spans and that human impact is minimal. This is consistent with the belief that past cycles always inform the present. Kininmonth told Australian Broadcasting Corporation (ABC) science program *Catalyst* in 2005 that:

the science underpinning the greenhouse scenario is flawed. The computer models are at a rudimentary state of development. The actual science of climate would suggest that we are near the peak of global warming and that the prospect is in fact, in the longer term we're talking now thousands, to tens of thousand of years, is a gradual cooling. (Horstman 2005)

CSIRO atmospheric scientist Graeme Pearman, who since the 1980s had communicated the risks of loading the dice for climate change, retorted on the same program: 'I think it's rubbish. I think he's not an expert, he hasn't tested his ideas in the open literature, that's what scientists have to do.'

Like other sceptics in retirement from active science, Kininmonth has 'found fame in the twilight of his career,' noted Melbourne *Age* journalist Melissa Fyfe, in her article on the Lavoisier Group which promoted Kininmonth's thinking. He was also named as a science adviser, along with Bob Carter, at the US Science and Public Policy Institute. British professional sceptic Christopher Monckton has been the chief policy adviser for this sceptics organisation dedicated to 'sound science including climate scepticism' (<http://scienceandpublicpolicy.org>).<sup>3</sup>

## Targeted attacks on environmental science, political interference

Disciplinary differences may have predisposed some scientists to a sceptical and combative stance in the public discussion on climate change. But the evidence shows there has also been a targeted attack on climate science, and environmental science generally, coming from some political and corporate interests, which have drawn on the same sceptic names. In the United States, in particular, there is evidence of political interference and political attacks on climate scientists and their data in the early 2000s under the neo-conservative government of George W. Bush.

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<sup>3</sup> When Kininmonth's book denying anthropogenic climate change was launched by the Lavoisier Group in 2004, Zillman agreed to launch it and then gave a remarkable speech supporting freedom of debate but criticising Kininmonth's non-peer reviewed analysis that assisted those who denied the anthropogenic influence (along with natural variation) when the preponderance of the evidence now pointed to it (Zillman 2004).

In March 2004 the US Union of Concerned Scientists (UCS) published an open letter called *Scientific integrity in policymaking* signed by 62 prominent scientists, including Nobel laureates, and heads of federal agencies and universities (Union of Concerned Scientists 2004). According to the UCS website, 12,000 scientists are said to have signed this document by 2010. The letter said that the Bush administration in the United States (2001–2009) encouraged systematic interference and misrepresentation of findings, including those on climate change, and that this compromised the integrity of science communication.

The letter spoke of 'consistent misrepresentation of the findings from the National Academy of Sciences, government agencies and the expert community at large'. The UCS also asserted that this misrepresentation was accompanied by 'disreputable and fringe science reports and [by] preventing informed discussion on the issue' (Union of Concerned Scientists 2004).

A 2007 survey of working government scientists in the United States supported these findings with personal testimony.<sup>4</sup> There are documented complaints about government reports being shelved, conclusions being altered or deleted, political operatives second-guessing scientists and cases of scientists being harassed by Congressional committees. The survey found that more than 40 per cent of respondents reported pressure to eliminate words like climate change and edit reports to change their meaning. Other practices that were reported included: not issuing press releases, changing press releases by injecting uncertainty or making communication so bland or technical that nobody would give it a second glance (*Atmosphere of pressure* 2007).

There is not a similar body of evidence of this level of interference in Australia. But a dampening effect on communication to the public can be assumed given charges of government scientists being 'muzzled' from 1996, when the conservative parties came to power federally (Cohen 2006; Pockley 2007; Hamilton & Maddison 2007). With the closely allied political and economic views of Australia and the United States through the latter part of the 1990s and early 2000s, a similar dampening approach to the science was on the cards.

Thus veteran science writer Peter Pockley described in an interview what the Coalition government under John Howard signalled to public science agencies: 'Scientists were told you don't say anything that might embarrass the government or the minister.' Control was also exercised through an increasing emphasis on commercialisation within the CSIRO and a de-emphasis through budget cuts on public interest science agencies, such as Atmospheric Research and Wildlife

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<sup>4</sup> The report *Atmosphere of pressure: political interference in federal climate science* was published by two non-government agencies: the Government Accountability Project (GAP) and Union of Concerned Scientists (USC). The UCS and GAP surveyed almost 300 scientists, carried out 40 interviews and searched thousands of agency documents (*Atmosphere of pressure* 2007).

and Ecology. 'These divisions were the target for political pressure during the 10 years of the Coalition ... with the extraordinary notion that scientists have nothing to do with policy in these areas of climate and natural resources.'

The bigger picture shows a considerable body of documentation, largely outside the academic journals, about what some call a 'war' on environmental science that started in the United States during the 1970s and, coinciding with the 30-year neo-classical economic experiment begun under President Ronald Reagan in the United States, that gained traction in Australia as I have shown (Mooney 2005). That world view pits public interest in the natural environment against economic interests and 'the market', unless it is a case of using the natural environment for gain.

## **Climate sceptic ties to neo-conservative think tanks**

In 2008, a trio of US social and political scientists published the extent of the links between scientific climate change sceptics and free market, neo-conservative think tanks (called neo-liberal in Australia). They found that more than 92 per cent of sceptical books published in the United States were linked to conservative think tanks and that 90 per cent of conservative think tanks interested in environmental issues took a sceptical approach to the evidence for climate change.

They concluded that the framing by sceptics of themselves versus the science was often not neutral but was 'organised by core actors within the conservative movement.' Promoting scepticism is a key tactic of the anti-environmental counter movement coordinated by conservative think tanks designed specifically to undermine the environmental movement's efforts to legitimise its claims via science (Jacques, Dunlap & Freeman 2008).

Their studies supported the view that conservative think tanks are politically powerful and funded by wealthy foundations and corporations. This tactic has been wielded successfully since the public battles over tobacco smoking and the hole in the ozone layer (Beder 2000; Rampton & Stauber 2002; Mooney 2005, Oreskes & Conway 2012). It's easy to forget that before anthropogenic climate change became a debate, a similar battle raged for 10 years from the mid-1970s over accepting human responsibility for the hole in the ozone layer.

The evidence shows that there is a close ideological affinity between free market, conservative North American (including Canadian) think tanks and those in Australia, such as the IPA, which receives considerable funding from

the resource sector and is closely allied with the conservative parties. The same holds for the Lavoisier Group—which was established specifically, under the lead of mining sector representatives, to counter climate change science. Their ideas are amplified by mass media, particularly the News Limited media.

Think tank, political and media ties were boldly on display in the lead-up to the 2013 federal election. On 4 April 2013 *The Australian's* publisher and long-serving IPA director and News Corp boss Rupert Murdoch was the keynote speaker at the think tank's 70th anniversary dinner. This was also attended by federal Coalition leader Tony Abbott and the world's richest woman, mining magnate Gina Rinehart. It is not unrelated that the Murdoch press in Australia after 2010 started a no-holds-barred campaign to oust the incumbent Labor government and install the conservative Coalition.

A few days later, Rinehart reported Murdoch's address in glowing terms in the conservative magazine *Quadrant*. She wrote that Baroness (Margaret) Thatcher would have applauded his thoughts and reported that Murdoch described his father as one of the postwar founders of the IPA in a proud battle against socialism, which is still being waged today. Their efforts helped to 'open up Australia by deregulating, privatising, reducing tariffs and floating the dollar'. Rinehart described Murdoch's assertion that Australians must be brought to understand that markets are not only efficient, but fair and moral agents bringing freedom and prosperity. In sum, Australia should unleash more economic rationalist policies (Rinehart 2013).

As a prime ministerial contender, Tony Abbott vowed to do so on the same night singling out environmental protections and climate change responses and bureaucracies in particular to be abolished along with a federal mining tax.

On that night the IPAs corporate and political soulmates were bold and revealing of the vision and agenda of this war of ideas. In this realm of thinking, environmental protection and in particular climate change science, and policy response, are counter to the interests of market forces and business empire builders like Murdoch and Rinehart.

The following example from the *IPA Review* is typical of how these battles have been waged over the years as an attack on the scientists seen to be standing in the way of 'freedom and prosperity'. *IPA Review* editor Mike Nahan wrote in an article entitled 'The demise of science':

Why have so many scientists succumbed to being myth-makers? One answer is money. Shock and horror not only sells newspapers and generates donations for NGOs, it also generates funding for research. And as Professor Bob Carter discusses in 'Science is Not Consensus'

(pages 11–13) changes to the funding of science in recent years have increased the incentive for scientists to join in the doom and gloom. (Nahan 2003)

With Abbott in the prime minister's chair in 2014, the success of this ideological attack is manifest. *The Canberra Times* reported in an editorial bemoaning the 'puerile' debate about climate change: 'The newly elected Abbott government won office on the back of opposing even a modest penalty or price on carbon pollution, a policy that once had bi-partisan support' [and] 'Mr Abbott's chief business adviser, Maurice Newman publicly and without embarrassment labels climate change a "scientific delusion" ... he even says the carbon tax, which has been in place for just 1½ years helped destroy manufacturing in this country' ('Self-interest key to weather debate' 2014).

Look up Maurice Newman and you find a free marketeer who has wielded influence with both sides of federal politics in the last two decades. A former stockbroker and investment banker, Newman served as chairman of the Australian Stock Exchange and later was appointed under the Howard government first as a director and then chair of the public broadcasting ABC board for much of the 2000s. Newman was a co-founder of the conservative think tank the Centre for Independent Studies (CIS), which promotes the late economist Milton Friedman's free enterprise vision. Newman has not been convinced by climate change science or the need for renewable energy. Under his watch at the national broadcaster, Murdoch delivered the 2008 Boyer Lecture on the theme 'A golden age of freedom'. Also in 2008 the ABC broadcast *The Great Global Warming Swindle*, a British program criticised for its inaccuracies by the British broadcasting regulator.

## Global aids to uncertainty and inaction

Since the early 1990s, the fossil fuel lobby has mounted an extremely effective campaign of deception and disinformation designed to persuade policymakers, the press, and the public that the issue of climate change is stuck in scientific uncertainty. (Gelbspan 2004: 40)

The same distortions of the public discussion on climate change have been in effect in other Western English-speaking countries and perhaps not coincidentally where News Corp operates. But News Corp has also had a lot of like-minded help to influence the public, coming from the Global Climate Coalition and its constituent corporations. *New Scientist* reported that framing techniques, used in Australia and the United States during the 1990s and since, were also operational in Britain in the 2000s, featuring familiar global mentors.

In an editorial 'Still in a mess over climate change' (2006), *New Scientist* echoed what some environmental groups and investigators have reported since the 1990s about the oil company Exxon Mobil's long-standing and extensive funding of lobby groups, think tanks and individuals that, the science magazine said, misinform the public on climate change (Examples of Exxon Mobil's influence have been documented by Greenpeace's Exxonsecrets at [www.greenpeace.org](http://www.greenpeace.org); Beder 2000; Gelbspan 2004; Mooney 2005).

*New Scientist* reported charges against Exxon Mobil that stemmed from no less than the Royal Society in London which sent 'a measured complaint' to the oil company about these practices, only to be ignored. *New Scientist* fumed that such arrogance towards one of the world's oldest scientific institutions 'seems to rival their contempt for good science itself' ('Still in a mess over climate change' 2006: 5). The editorial described public discussion in Britain in the mid-2000s as beset by familiar public relations and propaganda tactics of sowing confusion and name-calling, (e.g.: theories of climate change being described as the 'big lie').

Further evidence for the corporate strategy of using sceptical scientists to sow uncertainty into the public discourse surfaced in the Australian media in 2007 and again involved Exxon Mobil. Following the release of the fourth IPCC assessment, *The Sydney Morning Herald* revealed in a page one report that Exxon Mobil was offering \$10,000 to scientists to dispute the IPCC findings ('Bribes for experts to dispute UN study' 2007).

Recently, evidence has emerged from New Zealand of an organised attack, with international links, orchestrated to sow doubt on scientific weather readings. The New Zealand Climate Science Coalition is allied with the International Climate Science Coalition (whose science adviser is none other than Australian geologist Bob Carter, according to its website). It has waged a three-year court battle to discredit temperature data gathered by the National Institute of Water and Atmospheric Research (NIWA). According to newspaper reports, taxpayers have been saddled with the court costs as the Coalition went into liquidation rather than pay costs.

The data showed that at seven stations from Auckland to Dunedin, between 1990 and 2008, there was a warming trend of 0.91 °C, according to NIWA scientist Jim Salinger, who reported the saga in January 2014 (Salinger 2014).

## The language of negative framing

Calling the global scientific consensus a 'debate' has been one of the most familiar framing devices of the past 20 years and reflects a recognisable propaganda technique: to encourage emotional reactions, in this case of uncertainty, in an

audience. Decrying those who want to ‘shut down debate’ or ‘politicise the science’, or are said to merely seek self-advancement/research funding and are therefore indulging in public ‘scaremongering’, have been frequent examples of stirring the pot of uncertainty.

Of course, even a cursory look at mass media outlets, the talkback radio sphere or the blogosphere shows that negative labelling techniques are not confined to anti-climate science and free market intellectual warriors linked to right-wing think tanks. Public discussion has been polluted on a wide front with language that encourages negative emotions and distrust of scientific expertise and political leadership, arguably leading to more public disengagement and confusion.

The combative propaganda approach serves a political economy focused on free enterprise rights and a re-emergent vision (as spelled out by Murdoch in his IPA speech) that society need be no more than a collection of self-interested individuals engaged to markets. Taken together, these forces are a recipe for more ‘whistling in the dark’ as land, sea and atmospheric systems are damaged, linked to a growing catalogue of climate-driven natural disasters.

## **Ingredients for cooking up confusion and distrust of science**

In the mid-1990s conservative members of the US Congress charged that environmental science was biased and a congressional committee investigated—putting on the record a catalogue of techniques still used today by those who oppose public interest science. The congressional report—*Environmental science under siege: fringe science and the 104<sup>th</sup> congress*—documented attacks against climate scientists and others working with environmental and public health regulations (Brown 1996).

The congressmen who made the allegations and the sceptic scientists they called to testify alleged that environmental scientists couldn’t be trusted. The investigating committee found there was no basis to this and made a useful summary of how public communication has been confused as a result of attempts to discredit the scientists.

The recipe for confusion used by sceptical individuals and organisations included: abusing the goodwill of democratic and scientific practice by diverting time and attention to the views of a few dissenting scientists; launching sceptical attacks that consistently mix scientific data, opinion and policy advice while mainstream scientists do not have this luxury; dismissing or misusing scientific

conventions, including peer review, consensus and uncertainty. In the 15 years since, it is possible that not just climate scientists, but aspects of science itself, have come under siege as a narrative of mistrust is elaborated.

A year after the Brown report, a concerted attack on environmentalists and climate change science appeared on mainstream British TV station Channel 4 and was repeated by the ABC in Australia in 1998. The 1997 two-hour *Against Nature* documentary directed by Martin Durkin made good use of a number of familiar media techniques. Durkin included opinions from alleged expert scientists without providing context or biographical information to prove their claims to be climate change experts. He also failed to mention the larger context or balance of evidence—the IPCC international scientific reviews that have sounded the alarm since 1990.

The presenters interviewed included S. Fred Singer, a retired US space physicist and science administrator, who was active in the battle to deny industrial responsibility for ozone depletion before moving on to anthropogenic climate change. He is a good example of a professional contrarian and was amongst the sceptics invited to present their views on climate change in Australia during the mid- to late 1990s, sponsored by conservative, free market think tanks but also by the CSIRO (Beder 2000). As is often the case with retired sceptics, Singer did not publish his critiques in peer-reviewed science publications. His activities through various campaigns against public interest science are instructive.

In the 1990s, Exxon Mobil supported Singer's policy research group and he first earned his sceptic tag by appearing as an expert for the tobacco industry. The tobacco campaign, as many researchers have pointed out, honed the public relations and communication strategies that are still used by corporations today. That campaign popularised the phrase 'junk science', which subsequently has been used by both sides to discredit opposing views. It also popularised the use of scientific experts rather than corporate spokespeople to make the industry's case (Beder 2000; Rampton & Stauber 2002).<sup>5</sup>

The UK Independent Television Commission subsequently found that *Against Nature* was misleading and distorted interview information. Investigations found that, while the script echoed extreme conservative arguments against environmentalists, the program's director described himself as a Marxist. He was linked with a small far-left group, the Revolutionary Communist Party, which also had links to several of the featured experts. This group believes that sustainability or environmental concerns are conspiracies against progress for Third World people (Monbiot 1997). So it seems attacks on environmental science come from multiple political standpoints within Western society.

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<sup>5</sup> Singer was also a lead author of the highly criticised but effective *Leipzig Declaration on Global Climate Change* that showcased dissenting opinions (Beder 1997: 238).

A follow-up program, *The Great Global Warming Swindle*, was made by the same director and UK Channel 4 and aired in Australia in 2008. It yielded similar complaints about distortions and inaccuracies of the science, which were found to be valid by the British broadcasting regulator (Cubby 2008). When shown on ABC television in Australia it received a large audience. The slick packaging, persuasive images and experts with science labels, led to anecdotal responses that this program successfully created public confusion or uncertainty.

British journalist George Monbiot was asked in 1997, after the first *Against Nature* program, which he investigated, how ideas like the ones showcased in that program could receive a two-hour, prime-time television slot. He said he had found that:

Many television executives hate environmentalism. They see it as a grim *memento mori* at the bottom of the pictures, spoiling the good news about cars, clothes and consumerism. So when the film-makers suggested an all-out assault on environmentalists, their proposal fell on fertile ground. (Monbiot 1997: 1)

Fostering a climate of uncertainty since the mid-1990s has been an effective strategy for creating and maintaining public confusion and official inaction on climate change. It's worth taking a closer look at why we expect certainty and how applying uncertainty to environmental research findings has been a favoured tool for contesting research findings about future consequences of human activities. There are lessons for controversial environmental science and public policy throughout.

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