A Cool Look at Professor Aitkin's Global Warming Scepticism

Geoff Davies

Professor Don Aitkin's sceptical view of global warming, presented to the Planning Institute of Australia on April 2nd, has been widely publicised. He claims that the current level of warming is not historically unprecedented, that the link between warming and greenhouse gas emissions is weak, and that we should not do anything to restrict emissions until it is "absolutely plain" that there is no alternative. He says the global warming issue is a distraction from the water and peak oil crises facing Australia.

Having failed to understand why climate scientists are advocating urgent action ("stridently", he claims), Professor Aitkin proceeds to play the people instead of the ball by questioning their motives, claiming, among other things, that having set up the IPCC the scientists have to keep justifying it by claiming there is warming.

Professor Aitkin poses several questions, the three most immediate being whether the Earth is warming, whether its present warming is unprecedented, and whether our burning of fossil fuels is causing the present warming.

However there are other equally important questions lurking behind this debate which usually get little or no attention. These are:

(a) Would it be so hard for us to change our lifestyle so as to reduce our possible contribution to global warming?

(b) Would we be better off in other ways if we so changed our lifestyle?

(c) Is it, perhaps, necessary that we change our lifestyle, for reasons other than global warming?

Professor Aitkin has touched on these questions, but he does not seem to see them as central. His main concern is clearly that effective action will be expensive and will therefore distract us from other crises.

Professor Aitkin wants a more open debate. It already exists, if he would look in the right places, but here I will engage him directly. I will first discuss his claims, then turn to my three additional questions, and finally close with my own brief assessment of our situation. I am responding to the text of Professor Aitkin's speech, to his two "Ockham's Razor" broadcasts on the ABC, and to some direct correspondence we have had.

Professor Aitkin makes much of the uncertainty of climate observations. There are certainly many uncertainties and complications, and a great deal of effort is devoted to overcoming or minimising the limitations of the observations. However Professor Aitkin claims scientists don't discuss them, particularly singling out the IPCC. In this he misunderstands or misconstrues the role of the IPCC reports: they are entitled "Assessment" reports. They are not just the science, they are an assessment of the science, using a process I will explain more later. Evidently he denies IPCC the role (I would say the responsibility) of assessing the state of the evidence. Nor does he note its consensus procedure and the political vetting of its final texts, both of which tend strongly to make its assessments conservative.

Professor Aitkin presents himself, on the other hand, as a paragon of disinterested enquiry. However he inevitably makes his own selections and

judgements of the evidence. For example he queries the claim that the present warming is unprecedented and cites one study arguing the Medieval Warm Period in Europe was warmer than at present. However a number of temperature proxies show the temperature to have been 0.0-0.3 degrees cooler than the mid-twentieth century (and thus 0.6-0.9 degrees cooler than now – you can see the graph on Wikipedia). Also, according to the US National Oceanic and Atmospheric Administration there is no clear evidence that the warm period extended outside Europe. Evidently Professor Aitkin has not taken his own advice on the difficulties of estimating global averages. Nevertheless he stated quite firmly in his broadcast that the present warming is no greater than that of the Medieval Warm Period.

More egregiously, Professor Aitkin makes no significant mention of dramatic changes in the Arctic, nor of pervasive and rapid retreats of mountain glaciers. These are noted (p. 6) only as "the evident melting of sea ice and the retreat of some glaciers". In this statement he misrepresents the observations of mountain glaciers, which are indisputable, and glosses over perhaps the most dramatic and disturbing symptom of warming, to which I will return.

Professor Aitkin claims there is no reasonable evidence that greenhouse gas emissions are the cause of the present warming (though he acknowledges well-established basic physics). One of his arguments is that there is "no dramatically linear relationship" between the two during the twentieth century. But of course there are natural short-term fluctuations in temperature (which sceptics like to emphasise) but not in the rise of carbon dioxide, so we don't expect any simple linear relationship, particularly in the short term. This is a superficial and uncompelling argument.

Another argument, frequently raised by sceptics, is that during the ice ages temperature rises preceded carbon dioxide rises. Professor Aitkin leaves the implication dangling that we don't understand why, and that this also shows that carbon dioxide levels do not determine temperature. In fact this topic is well (if not widely) understood. The ice-age fluctuations were triggered by fluctuations in the amount of heat received from the sun (due to slow gyrations of Earth in its orbit around the sun), but the temperature fluctuations would have been minor were they not strongly amplified by the carbon dioxide released as temperature rose. The amplification also explains the strongly asymmetric temperature fluctuations (slow cooling, rapid warming). The conclusion is that carbon dioxide was the dominant factor, though not the trigger. The ice age observations thus strongly support the hypothesis that a rise in carbon dioxide levels causes a rise in temperature.

Our present situation is different from the ice age situations. Solar heating has not changed significantly, but carbon dioxide levels have gone up a lot, higher than they've been for at least three million years. Our understanding of the ice age fluctuations gives us strong reason to expect that temperatures will increase, with a time lag of a few decades. The fact that the mean temperature has increased by at least 0.6 degrees celsius over the past few decades (a conclusion Professor Aitkin does not dispute) is then reason for serious concern.

There is additional, longer-term geological evidence in which carbon dioxide levels correlate well with surface temperature. The implied temperature variation is, if anything, greater than computer climate models suggest. Thus, contrary to Professor Aitkin's claim, there is independent and strong evidence that greenhouse gases cause warming. Climate models, for all their imperfections, confirm this, which is one reason to take them seriously, if cautiously.

Professor Aitkin asserts that "there is simply no evidence" that polar ice will melt and that sea levels will rise. The only citation he makes is to a claim that recent evidence may show a slight cooling of the oceans over the past five years. Even if

substantiated, that would be no basis for his grand assertion. He fails to mention clear evidence of the acceleration of both melting and ice movement in Greenland. There is also clear geological evidence for polar melting and sea level rise accompanying higher temperatures. Three million years ago, when the Earth was 2-3 degrees hotter, sea level was 15-35 meters higher. This is roughly consistent with evidence from the last glacial maximum and from a warm period 40 million years ago that around 20 meters of sea level change occurs for each degree of temperature change. We are likely to experience at least 2 degrees of warming. The complete melting of the Greenland and West Antarctic ice sheets would contribute about 7 meters each to sea level, so evidently even more ice was lost three million years ago under not dissimilar conditions. Professor Aitkin's discussion of potential sea level rise is quite deficient.

He notes that the IPCC forecasts a sea level rise of around 30 cm this century, but says this is no reason for concern because, for example, the low-lying Tuvalu islands already experience sea level fluctuations because of El Nino. But of course the natural fluctuations would be added to the global rise. Damage occurs during peaks in the natural fluctuations, such as king tides and storm surges, as New Orleans found out. This is a superficial and irresponsible dismissal of concern for the livelihoods, communities and lives of millions of people.

Professor Aitkin queries computer climate models at some length. They are indeed still significantly limited, and their results must be treated with care. However our conclusions about global warming do not rest solely on computer models, as the preceding discussion will have made clear. Professor Aitkin reveals his superficial understanding by claiming that if they can't make a reliable 24-hour forecast then one shouldn't believe long-term climate forecasts. He evidently lacks the elementary understanding that *weather* causes erratic fluctuations around a relatively slowly changing mean, and that *climate* is about the long-term means. He also suggests their climate forecasts would be more believable if they would forecast the climate for 2009. However climate scientists repeatedly emphasise that one can't reach conclusions about global warming from a single year's record, nor even from trends over a few years, one has to look at longer-term trends.

Having failed to appreciate some of the key arguments supporting the global warming hypothesis, Professor Aitkin turns his attention to explaining to himself why climate scientists persist in making urgent pleas to curb greenhouse gas emissions. He suggests they are protecting their turf, reputations and pet idea, and revelling in the extra funding and influence they are receiving. He describes the more activist scientists, and environmentalists in general, as holding a "quasi-religious" view. He says The Greens, "greens" and environmentalists welcome and propagate the global warming view because it fits their own perceptions (implying that those people have no rational basis for their views). He says even democratic governments like to have issues to scare people with. (Well yes, we've certainly seen the terrorism threat used that way, but I struggle to think of a government that has yet turned to global warming to scare its citizens, as all of them have had to be dragged kicking and screaming to acknowledge the problem.) He says people have an appetite for horror stories, and the media love to play to that (no argument there, but the media don't care which story they peddle).

There are quite a few things one could say about these characterisations, only a couple of which will be noted here. Sceptics love to claim climate scientists are only in it for the research funding, ego tripping, alleged influence and so on, but they rarely mention the trillions of dollars and dominating global influence that fossil fuel industries have at stake, and that ExxonMobil in particular actively protects. Professor Aitkin laments that he has been called a "denialist" by others, yet he labels

climate scientists as quasi-religious and with the several other descriptions just mentioned.

In our correspondence he said "scientists" have said apocalyptic things before and been wrong, so why are they right now? I think Jared Diamond's assessment, in his book *Collapse*, is more valid and pertinent. Diamond recounts the stories of civilisations that failed to heed danger signals, and collapsed. He recounts the stories of others that saw trouble coming, acted apprpriately and in time, and avoided collapse.

Scientists are human, and scientific debates fall short of the ideal. There is turf protection and self-promotion, and rancour is not uncommon. As an advocate of a minority view in my own field for twenty years, a view ultimately vindicated, I am personally acquainted with these imperfections. The IPCC process is specifically intended to step back from the front-line disputes to see what scientists can agree on. This is the part of the IPCC process that seems to have completely escaped Professor Aitkin's understanding.

Even so, not everybody ends up satisfied with its assessments. Many, me included, feel it is too conservative. However in reaching for the conspiracy theory favoured by sceptics and denialists, to make up for his own deficient understanding, Professor Aitkin besmirches a great many excellent and conscientious scientists.

Professor Aitkin makes belated acknowledgement in his speech of the precautionary principle, which is basically that we would be wise take some preventative action as insurance against potential catastrophe. His view seems to be, as best I can understand it, that there may be many possible reasons for climate change, so we'd be foolish to assume we've identified the real culprit and should therefore just accept and adapt to whatever comes to pass. When I reminded him in correspondence that to act effectively to avert global warming we know we must act before there is certainty, because of the time lags in the climate system, he said that my argument for the insurance policy view would only apply if the climate scientists are certainly correct. I don't pretend to understand the logic of these statements.

Professor Aitkin identifies himself as a historian and political scientist. At best, he can be seen to have made the classic mistakes of a neophyte – failing to identify key evidence, key arguments and reliable voices among the confusion of a large, active and complex field, and resorting to a conspiracy theory to explain what otherwise he could not understand. He acknowledges two prominent sceptics as guides in an unfamiliar field, which perhaps was not the best way to undertake the comprehensive and disinterested investigation he says he aspired to. His patronising and sweeping characterisation of environmentalists as quasi-religious, and his dismissal of the idea that we could deal with several problems simultaneously as Utopian (see below), reveal limitations of his own world view. Such prejudices have clearly conditioned the conclusions he was able to reach.

Professor Aitkin considers global warming to be a distraction from more immediate crises, such as water and peak oil. When I put to him that sensible action would mitigate all three crises, and others besides, he brushed me off in his patronising style as "Utopian". This brings us to my three questions. It is implicit in Professor Aitkin's arguments that his answers would be (a) it would be difficult and costly to change, (b) there are no other benefits to changing, in fact it would be harder to deal with other crises, and (c) there are no other compelling reasons to change. This is clearly a widespread set of views among sceptics, vested interests and most government agents.

There is, on the other hand, widespread, growing and well-justified concern that our Western consumer lifestyle already exceeds the ability of the Earth to sustain it. Among the syptoms of this are increasing shortages of fresh water, sick river systems, degradation and loss of soil, rapidly declining forests and their rich biodiversity, sick and dead coral reefs and their rich biodiversity, rapidly declining fisheries, and chemical pollutants from pole to pole, concentrating up food chains, decimating many creatures and showing up in a range of human symptoms. It is also widely believed that the rate of discovery of oil will now decline, just as demand is rising even more rapidly.

All of this would seem to say clearly we should wean ourselves off oil and we should reduce our materialist obsession with owning ever more stuff. It is becoming widely recognised that buying things does not lead to life satisfaction, it leads to ever more frenetic living, and that we need to shift to a thriftier but more satisfying life style. Professor Aitkin says as much himself, though for him it seems to be more a matter of virtue than necessity. It is, however a necessity, because if we don't reduce our demands on the Earth we will suffer famines, plagues and surely wars as Earth's soils and ecosystems progressively degrade and disintegrate into chaos.

It is not so widely appreciated how relatively easy it is to reduce our wasteful use of energy and other resources. Energy use and greenhouse emissions have been reduce by two thirds or more by major corporations and many individuals, and they have saved money as a result. As our energy needs decline, renewable resources become more sufficient and the old and dirty sources become unnecessary. It is not true that renewable energy would be seriously unreliable, despite the ignorant and self-interested claims of big-energy advocates.

Recycling of materials is increasing rapidly, and Germany requires ninety percent of car components to be returned to manufacturers for recycling. There is little reason why our ingenuity will not lead us to recycle almost all materials indefinitely. This path will indeed mitigate the many crises now confronting us. In fact it is the only path that will allow our grandchildren's grandchildren to inherit a rich and fulfilling world.

Finally I will offer a brief alternative assessment of the present situation regarding global warming. There are a number of signs that global warming is proceeding much more rapidly than anticipated, and human emissions are also increasing faster than expected.

In the northern summer of 2007 the area of Arctic sea ice fell about 40 percent below the mean for the summers of 1979-1990. It's volume was down by about 80 percent. Although a slow decline had been in progress, the decline in 2005 and then the larger decline in 2007 represented a dramatic acceleration of the trend. The level reached was not anticipated to occur, either by ice experts or by IPCC modelling, until around 2040. If continued, the new trend would result in an ice-free summer Arctic within 2-5 years; this was not anticipated until around the end of the century.

Ice has reformed over the past winter, but it is thin "seasonal ice" that melts much faster than "old ice", which is typically 5 years old or more.

(When I mentioned evidence for recent acceleration of warming in our correspondence, Professor Aitkin asked what evidence? "You can't just mean that the IPCC's view of Arctic ice melting may have been understated. Surely the change since 1998 can't be described as 'rapid acceleration'!" This is further evidence of Professor Aitkin's egregious ignorance of crucial observations, or their significance.)

Dramatic warming of the Arctic has been evident for some time. The plight of polar bears has received publicity, but the lives of indigenous people have also been

disrupted and there have been dramatic changes in marine life. While sceptics and denialists quibble about whether "global" temperature changes can be properly measured, the changes to the Arctic are dramatic and indisputable.

The shrinking of the Arctic sea ice is disturbing not only because it is a dramatic change in the condition of the Earth, but because the exposed sea absorbs much more of the sun's heat than does the ice that used to cover it. Thus warming of the Arctic sea, and of the whole Arctic, will inevitably be accelerated. This is one of several effects that have the potential to become mutually reinforcing.

Permafrost is already melting around the Arctic. The permafrost and cold northern soils contain large stores of carbon and methane (which is a greenhouse gas at least twenty times more potent than carbon dioxide). Those stores are possibly larger than all stores of fossil fuels, including coal. As permafrost melts and soils warm those stores are released. They further accelerate the warming, potentially disastrously.

Melting of the Greenland ice sheet is accelerating. Glaciers are also accelerating, and the occurrence of "icequakes", indicating ice fracturing and movement, is increasing. Surface meltwater has been plunging through fissures to the base of the ice sheet, kilometers below, where it floats the ice and lubricates its motion. These phenomena are not well understood, but have the clear potential to lead to much more rapid breakup of the Greenland ice sheet than was previously thought possible. That would raise sea level by about seven meters. The situation in Antarctica is less clear overall, but several floating ice shelves have disintegrated in recent years, and glaciers have accelerated, so there is ample reason for concern.

The fear is that as sea-ice melting, permafrost melting and other phenomena progress they mutually reinforce each other. They could become a series of dominos, each tipping the next in an unstoppable sequence. The fear is that the Arctic sea ice is the first big domino, and that the fall of the dominos could take us into major and irreversible global warming. The potential for these dynamic interactions is widely recognised in the profession, but Professor Aitkin's discussion gives no indication of any awareness of them, which is further evidence of the deficiency of his education in global warming.

If a runaway shift into a substantially warmer climate occurred, the survival of the present global economic system would have to be considered uncertain at best. This is why increasing numbers of climate scientists have been calling for urgent action, much sooner than the current international talks are considering. Given that we need to act for other reasons, that reducing our material wastefulness will not be very expensive, and there will be spin-off benefits, we shouldn't wait for international agreements. If you are with a group in a row boat on a river and you notice the current getting faster, then you hear what sounds like a waterfall, do you say "I won't row until all of you row"?

Dr. Geoff Davies is a geophysicist at the Australian National University and the author of *Economia: New Economic Systems to Empower People and Support the Living World* (ABC Books, 2004). He is not a climate scientist himself, and thus has no professional stake in the debate. www.geoffdavies.com .