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Climate change – a failure of democracy?

**Professor Phil Cocks
Western Australia**

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I would like to thank the Trustees for the singular honour of being awarded the Farrer Memorial Medal for 2008. I join a most illustrious group. I also thank my former colleagues in South Australia, at ICARDA in Syria and, more recently, at the University of Western Australia, for their support and encouragement. Finally I thank my wife Margaret for her support and for the benefit of a very critical mind.

Through modern eyes William Farrer is remarkable both for his achievements in wheat breeding and for his application of the infant science of genetics. With the Australian discoveries of nutrient deficiencies, his work was fundamental to the establishment of the Australian wheat industry. He was indeed one of the first, if not the first of Australia's great agricultural scientists.

In the magnitude of its consequences, no other invention rivals agriculture. It tamed wild plants and animals, led to the discovery of the arts and sciences, and remains the basis of the world economy to this day. It has overseen a population growth of from perhaps 100,000 to 6 billion today. On the other hand, its ecological consequences (salinity, soil erosion, loss of forests and uncontrolled floods) have caused the decline or extinction of the Sumerian, Greek, Maya, and Roman civilizations. Today, we are again threatened by an environmental disaster - climate change - caused once again by our poor management of natural resources.

This talk looks at the politics of resource management and the underlying values of our society which lead us to the decisions we make. With a focus on climate change it takes you into the political process itself, the extent to which it is based on reasoned debate, and its underlying values which permit – even encourage – such devastation.

Modern democratic government

First I will look briefly at the idea of democracy.

In the last 2,500 years there have been three major forms of democracy. The first might be called participative democracy, where each citizen contributes to the resolution of important questions. Such was the practice in many tribal communities, in ancient Athens, in the Roman Republic, and to a lesser extent in modern electorates such as Switzerland and California. While they result in significant participation they are cumbersome and, where populations are large, slow and often conservative.

The advent of communism resulted in a new form of democracy under the control of a single party. The smallest communities were self governing as far as possible and took place in a larger national system: delegates were elected to district, regional, provincial and national assemblies. Each delegate was directly responsible to the assembly below. The fall of this system in the late 1980s demonstrated that, although it provided direct participation, it failed because it was cumbersome, slow to act, and failed to provide choice.

We live in a democracy where we elect representatives to local, state and national assemblies to make decisions for us. It is rare for representatives to consult their constituents widely, but their overall performance is judged regularly by elections in which all citizens participate. Clearly, under this system we abrogate our right to be consulted in favour of a system that handles questions efficiently.

All forms of democratic government assume that political debate is based on reason – the drawing of conclusions or inferences from facts or premises. As Thomas Jefferson said in the 18th century 'whenever the people are well informed they can be trusted with their own government; and that whenever things get so far wrong as to attract their notice they may be relied on to set them right' (quoted by Gore 2007).

In 1939, EM Forster (1951) was able to give 'two cheers for democracy': one because it admits variety and two because it permits criticism. Forster does not mention the use of reason.

Indeed there is an ever-growing school of thought that the application of reason no longer holds in modern democracies. The historian/philosopher John Ralston Saul (1992) finds few democrats who have actively encouraged reasoned debate. His examples are Pascal Paoli (President of Corsica, the first modern republic), Thomas Jefferson (third president of the USA) and perhaps George Washington and William Pitt the Elder. What Saul calls 'blind reason' has largely replaced reasoned debate in the modern World. Blind reason assumes that to every question there is a right answer – epitomized by the Inquisition where the Church knew the answer and punished those who did not give it (Singer calls this phenomenon 'faith reason'). Blind reason is accompanied (says Saul) by 'heroes', who, like the inquisitors, 'know' the answers. Napoleon was one of the earlier examples of a hero but both George W Bush and Tony Blair acted like modern 'heroes' in the way they prosecuted and conducted the Iraq War.

Value systems

Value systems are the frameworks within which people make or follow decisions. They are the non-rational assumptions that we all make when we consider a course of action. Often they have a religious basis – Judeo-Christian in our case – although they may reflect the way we view nature or humanity.

The dominant value system in the west is, as John Black (1970) puts it, the dominion of man over the Earth's natural resources. This world view is supported by Judeo-Christian writing in Genesis, where 'God said let (Man) have dominion over the fish of the sea, and over the cattle and over all of the Earth'. 'And God said be fruitful

and multiply and replenish the Earth and subdue it'. Consciously or unconsciously, and whether Genesis is believed literally or not, this value system has shaped the way we think about the World. The Earth is to be 'subdued'; Man should populate it, and its natural resources exploited.

This world view is so widely held in the West that it is scarcely questioned.

We turn now to environmentalists. The view of Doug Casey, an influential American free market economist is that 'the green movement has most, if not all of the elements of a religion, and only a tenuous relationship with science'. This is a view shared by, among others, some members of the Australian parliament, for example the member for McMillan, Russell Broadbent. The influential neo-liberal think tank, the Lavoisier Group also promulgates this idea.

I think that, for many people, there is some truth in this assertion. For example, James Lovelock (1979) sees the Earth as an integrated organism of which we all form part. This is surely similar to pantheism, where the Universe, nature and God are equivalent and interchangeable. However, it is a value system that is also firmly based on the scientifically-generated view that biological and non-biological systems are inter-related.

Both value systems share the concept of stewardship, although in slightly different ways. In Genesis we read 'the Lord God took the man and put him into the Garden of Eden to dress it and keep it'. This implies that man, although outside nature, has a responsibility of stewardship toward it. In contrast, ecologists see themselves as part of nature, not outside it, and therefore their own and nature's fate as one and the same. Although different philosophically, both value systems have somewhat similar results.

Before leaving our consideration of value systems I would like to touch on the problem of resources held under common ownership, especially global commons such as the ocean and the atmosphere. While

this may be considered an economic issue it is, as Hardin (1968) puts it, essentially a moral issue and therefore an issue of values. Hardin used commonly-owned rangelands as an example. An individual herder, through self interest, will increase the grazing pressure to ensure that he captures the greatest benefit before his competitor does. If this happens the rangeland quickly degrades. The atmosphere is another such common good and is polluted through self interest as long the polluter perceives it to be in his advantage to do so. This may apply to individuals, corporations and nations. Its resolution cannot be made in simple economic terms or indeed technological terms.

Reason and logic in science

We turn now to the use of reason, and in particular the use of science on which to base decision-making, although science too reflects and shapes the value systems of its day.

Karl Popper (1959) revolutionized the philosophy of science. He rejected classical empiricism and the forming of conclusions from observations that grow out of it. Popper argued that scientific theories are abstract in nature, and can be tested only indirectly, by reference to their implications. That is, the theory (or hypothesis) comes first and is tested by subsequent observations. An hypothesis can only be proven wrong – you can never be certain that some test will not, in future, prove an apparently unassailable hypothesis to be incorrect. Hypotheses are not verified, they are only falsified. Popper's great achievement was to provide a philosophical basis for experimental science.

David Miller (1994) outlined cogently what is wrong with science based on observation and induction. Induction is the process of discovering explanations for a set of particular facts by estimating

the weight of evidence in favour of a proposition or theory. The theory can be verified by the consideration of yet more facts and may be retained in spite of some inconvenient results. Popper's falsification process, where any hypothesis is discarded when it fails just one test, is far more rigorous.

Nevertheless there are problems with Popper's approach when it comes to climate science. For example it is unlikely that hypotheses can be falsified except in the distant future when it is too late. Therefore scientists must use a more empirical approach where the weight of evidence is taken into account bearing in mind the philosophical weaknesses of this approach. This far from ideal approach gives us the opportunity to take action before the evidence reaches the 95% probability we normally expect.

Clearly, as Popper puts it, there is no ideal of certainty in science. As Barrie Pittcock (2005) says 'uncertainty is inevitable, but risk is certain'. What we need to do is satisfy ourselves that the risk of climate change is sufficiently high to justify action.

The concept of 'peer review' is an essential part of this process whereby a scientist's peers are given the opportunity to critically examine the weight of evidence and its interpretation. Results that are not peer reviewed are suspect, since there is no opportunity for the rejection of questionable results.

Although science does not use the same philosophical approach to problems as government, the latter should, and indeed does respect the formers' conclusions. This is for pragmatic reasons - as Bertrand Russell (1914) put it, 'the general principles of science. . . are believed because mankind has found innumerable instances of their truth.

The risk of climate change

I turn now to the risk of climate change.

In 1987, as a result of concern expressed

by leading climatologists, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to examine all aspects of the problem and to report back on measures needed for its management. Climate change was discussed at the Rio Summit in 1990, where Australia argued strongly for a Convention on Climate Change, an agreement that was established and signed by most nations at Kyoto in 1997. The IPCC has continued to gather evidence, the most recent of which was presented in Bali in 2007.

RK Pachauri (2007) in his acceptance of the 2007 Nobel Peace Prize summarized the key results of the IPCC thus far. They are:

- That climate change is caused by the burning of fossil fuels and the resulting pollution of the atmosphere by CO₂ and other gases. From a level of 280 ppm between 1000 and 1750, the concentration of CO₂ in the atmosphere rose to 379 ppm in 2005, far in excess of any figure seen in the last 600,000 years.
- If nothing is done global temperatures may rise by up to 4.50 C.
- Precipitation will fall by up to 20% in marginal areas, including large parts of Australia and Africa.
- Loss of ice in Greenland and the Antarctic could lead to sea level rises of up to 4m, and sea expansion could result in another 0.4 – 1.4m rise.
- If temperatures are to stabilize CO₂ would need to peak at less than 500ppm between 2000 and 2015.

There is an increasing view that the IPCC is underestimating the impact of climate change. For example the recent swift increase in atmospheric CO₂ (the rate of increase has increased by 35% since 2000) is due firstly to faster economic growth, and secondly to the inability of natural sinks to continue removing emissions at the current rate.

The economic benefits of managing climate change are clear. If nothing is

done Stern (2007) calculated that global GDP will fall by 5%/year, and if all risks are taken into account this could be as high as 20%. If climate change is managed – that is, greenhouse gas emissions are reduced to avoid its worst impacts – then the fall in GDP will be limited to around 1%/year. Stern sees the critical period as being in the next 10-20 years. His figures are similar to those of the IPCC.

The evidence that climate change is taking place, that its effects will be disastrous, and that by acting now the worst will be avoided, seem overwhelming. Yet there is a significant body of opinion that disputes the data, and in particular, disputes that climate change is caused by mankind's activities. The main points were summarized by Ann Young (2000) and were essentially based on information available to her in 1996.

- There is no evidence that higher levels of CO₂ will increase temperatures and indeed, she says, there are suggestions that temperatures may decrease (this view is no longer held).
- Global mean temperatures fluctuate normally (however, there have been no precedents to the rise in global temperatures since 2000).
- The data on sea level change is not convincing (however, the mass of water in the sea can be expected to warm only slowly compared with the atmosphere).
- Climatic models are inadequate (this remains a critical point, although they have markedly improved in recent years).

It is difficult to accept that these reservations, while we should bear them in mind, should prevent us from taking action.

Doing nothing – the response of some western governments

Faced with these problems the governments of Australia and the United States, and to a lesser extent Canada and Japan, have mostly ignored the advice

of their scientists. They have hesitated to accept the findings of the IPCC, I believe for four reasons:

- (1) The atmosphere is a global common and managing pollution is often not in a single nations' best interests: reasoned debate, in these circumstances, reinforces the Judeo-Christian concept of mankind's duty to exploit the World's resources;
- (2) Climate science, as discussed earlier, is an empirical science where theories rely on verification and not falsification. It is therefore not as rigorous as experimental science and therefore more open to misinterpretation;
- (3) There are groups of scientists outside the IPCC and outside mainstream science who strongly disagree with the mainstream interpretation;
- (4) Certain vested interest groups have used these dissident scientists and successfully lobbied governments by telling them what they (the governments) want to hear.

The result is a breakdown in trust between the governments' scientific advisers and their policy makers.

It is important to state that not all governments have reacted in this way. Indeed, the great majority of developed-country governments have followed their scientific advisers, set greenhouse gas reduction targets and have, to a greater or lesser extent achieved those targets.

Unlike many developed countries however, Australia relies heavily on fossil fuels. This is what concerns certain vested interest groups. In general they represent big business, and particularly the energy and mining businesses. Clearly, they have a vested interest in the price of energy. They have long enjoyed access to our major political parties and, most significantly but not only, to the Liberal Party. In this way they have bypassed public debate and

attempted to discredit scientific advice.

We should note in passing that the Liberal Party took to the 1990 election a policy whereby Australia would commit to a 20% reduction in greenhouse gases by 2000, a far more ambitious target than anything suggested before or since. What happened? Guy Pearse (2007) put it simply – after 1996 the Party was 'captured' by the energy and manufacturing lobbies.

The key business interest group in Australia is the Australian Industry Greenhouse Network (AIGN) a wealthy group supported by, among others, BHP Billiton, Rio Tinto, Woodside, BP, Exxon-Mobil, Caltex, Shell, Wesfarmers and Alcoa. They would not number themselves among greenhouse sceptics but have argued that taking immediate measures will excessively harm our economy. They believe that clean coal technology and nuclear energy can be developed to the extent that within 15-20 years emissions in Australia would be significantly reduced. The Howard government followed their advice, closing the door to reasoned debate. It will be interesting to see the extent to which AIGN influences the new Labor government.

At the opposite extreme is the Lavoisier group, which is frankly sceptical of the IPCC's science. Their influence has been less at whole of government level but deeply influential among individual members of parliament. Chaired by a former Hawke government minister (Peter Walsh) the group believes that the IPCC are bordering on the dishonest, especially in the way that they (the IPCC) pressure other scientists to fall into line.

The gist of the argument of this group is:

- That the models used to predict climate change are unreliable;
- That scientists supporting the IPCC are under political pressure to do so;
- That anything Australia does is insignificant compared with emissions from the USA and China.

Are models unreliable? There is considerable confidence that climate models provide credible quantitative estimates of future climate change, particularly at continental scales and above. This confidence comes from the foundation of the models in accepted physical principles and from their ability to reproduce observed features of current and past climate changes. Confidence in model estimates is higher for some variables (e.g., temperature) than for others (e.g., rainfall). Over several decades of development, models have consistently provided a robust and unambiguous picture of significant climate warming in response to increasing greenhouse gases.

The idea that scientists supporting the IPCC might be under political pressure to promote climate change is simply absurd. Political pressure from whom? In Australia it is clear that the opposite is more likely to be true.

The third point, that anything Australia does is insignificant, leads us to a consideration of the global commons.

Developed countries emitted greenhouse gases at very high rates for most of the 20th century, and so are responsible for most of the extra greenhouse gas now in the atmosphere. For this reason, in the initial Kyoto protocol, developing countries were, for the time being, excluded from binding commitments. Nevertheless, far from ignoring their obligations, many developing countries are actually setting more ambitious goals than Australia. China has set itself a target to source 20% of its electricity from alternative sources by 2020. It has also set stringent fuel economy standards for new vehicles, and national energy efficiency targets, neither of which has been done by Australia. Both China and India have signed the Kyoto protocol. And China has rigorous population control measures.

Brazil is a World leader in the production of biofuels. Bangladesh is

providing consumer credit for household solar energy. Biomass stoves are being distributed in many African countries, and 180 million such stoves have been installed in China. Small village-scale hydro-electric power plants have been installed. The argument that developing countries have done nothing is not tenable and will become decreasingly so in the future.

If we consider that every human being has an equal right to economic development, then surely a good starting point for equally sharing the load is to aim for equal per capita emissions. This recognizes the essential equality of people no matter where they live.

In 2002 Australians emitted 5.5t of carbon/person, compared with a world average of 1.2t and a high income country average of 4.1t. UK emissions were 3.3t and those of France 2.1t. Carbon emissions from China are presently 0.7t/person and from India 0.4t/person. Since the world average must be reduced from 1.2t to approximately 1.0t there is significant scope for Australia and the USA to reduce their emissions and perhaps some scope for small increases in most developing countries.

Issues of governance and the failure of our institutions

Since there is such overwhelming evidence of climate change what should we do and what can we do about addressing its threat. Clearly to begin with, we need a more rational debate, a better informed debate and, perhaps most importantly, a non-secretive debate. If we are to assist governments in their decision making and help our institutions succeed in comprehending the gravity and nature of climate change we need:

- A depoliticized bureaucracy: public servants who give advice without fear of reprisals and a government that makes their advice public;
- Non secretive external sources of advice to governments: lobby groups

registered, their sources of funds and links with political parties revealed, and their advice to governments made public;

- To bring our democracy closer to direct participation, local communities empowered to implement appropriate alternative energy solutions;
- Better understanding of the processes of science and democracy so that the community is empowered to take part in complex debates;
- To increase participation in debate, government and non-government internet sites available and widely used.

Ultimately we need three things:

- (1) A democratic world body to decide on issues involving global commons: the international body will formulate laws and an international court will enforce them. David Held (1996) argues that the only body available is a reformed United Nations.
- (2) A global price on carbon fixed by the international body – with an international carbon tax that directly taxes polluters.
- (3) Changes to the rules of the World Trade Organization overseen by the international body to prevent corporations from moving offshore to escape national regulations. These actions will need to reflect the welfare of all peoples and not just those with military and economic power.

In conclusion I would like to quote Royal Society vice-president Sir David Read who said: "People should not be misled by those who exploit the complexity of climate change, seeking to distort the science and deny the seriousness of its potential consequences. The science clearly points towards the need for us all - nations, businesses and individuals - to do as much as possible, as soon as possible, to avoid the worst consequences of a changing climate."

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