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## ANTHROPOGENIC CLIMATE CHANGE AND THE PRECAUTIONARY PRINCIPLE

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When I last contributed to *Ludus Vitalis*, my article was called “Global warming, equity and future generations.” It was duly published in volume XVIII, number 34 (2010). But there appeared alongside it a companion article from some of the editors, comparing belief in global warming to the early modern belief in witchcraft.

I will not comment on the ethics of such an attempt to undermine the credibility of a contributor to one’s own journal. What I want to do instead is to review the epistemology of climate change acceptance and skepticism, and then the ethical argument for taking climate change seriously, whether one fully accepts that anthropogenic climate change is going on or not.

As to epistemology, no one can doubt that levels of carbon dioxide in the atmosphere have risen since the pre-industrial period from 280 parts per million to over 400. However, such change could, in theory, be due to factors other than anthropogenic impacts. This was of course the period in which very large quantities of coal, oil and gas have been burned to turn the wheels of the industrial revolution. But it remains possible that the increases in levels of carbon dioxide are due to some other factor (such as sun-spot activity).

Almost unanimously, the world’s scientists accept that climate change is anthropogenic. One of the latest reports of the Intergovernmental Panel on Climate Change described this as ‘extremely likely’ (IPCC, 2013). But climate skeptics reject these findings, not least because a number of vocal journalists and politicians reject them. Because some disagreement existed, the British Broadcasting Corporation, whose charter obliges it to observe balance, used to pair up scientific experts on this matter with one or another of the skeptics, leaving the public with the impression that there was a scientific dispute about this matter. Anyhow, for the last two years or so the BBC management have recognized that there is in fact a scientific consensus among the vast majority of the world’s scientists, and that their

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previous policy was no longer justified. No longer are skeptics paraded in; instead, anthropogenic climate change is effectively recognized as fact, at least as far as the BBC is concerned.

Meanwhile, a large amount of indirect evidence has built up. For example, the glaciers of Alaska have reduced in level (as a BBC TV program compered by Simon Reeve displayed earlier this week), while one Alpine glacier in Switzerland has recently been declared extinct. There again, insufficient snow has been falling on the high Andes to allow the glaciers to be replenished there, and farmers who used to depend on the downstream rivers are facing water-shortages. There again, hurricanes afflicting places such as the Caribbean and the Philippines have become more intense, something to be expected as oceanic water temperatures rise; and unprecedented floods have been experienced even in Britain, with rivers such as the River Severn (and many others) overflowing their banks. These are the very phenomena predicted to happen as temperatures rise; and the rise of temperatures is to be expected as emissions of carbon dioxide accumulate.

It is true that temperature increases have take place before in past geological ages. But they have never happened at such an alarming rate as the increase from 280 ppm to 400 ppm of the last 150 years. It is also true that volcanoes can affect the weather, as in 'the year without a summer' of 1816, but there has been no accumulation of volcanic activity on the scale needed to explain the increase of carbon dioxide just mentioned.

It is true that El Niño and La Niña impacts also affect the weather at a global level. They help explain, indeed, why temperature increases are not linear, yet they do not suffice to account for the upward trend in levels of atmospheric carbon dioxide.

It is also true that sun-spots are capable of affecting the weather of our planet. The ecologist Charles Elton used to toy with sun-spot activity as the cause of the fluctuations of the populations of hares and lynxes in the Hudson Bay region. Even so, Elton eventually discarded this theory, and the fluctuation of populations now seems to have been a natural phenomenon, explicable by successful predation so reducing the population of hares that the population of their predators, the lynxes, was greatly reduced, until the population of hares recovered. The sun-spot theory of global warming appears to be neither necessary nor sufficient to explain such increasement, particularly in view of well-documented anthropogenic carbon emissions of the last century and a half.

There is thus a strong case to believe in anthropogenic global warming. The case that I have just presented gives only a small fraction of the available evidence. Anyway, it is sufficient to show that we have good reason to hold that the processes which contribute to continued anthropogenic global warming generate serious risks for human beings and for the other

species with which we share the planet. Changes to the habitats of many species are being recorded as well by the life sciences, and are thus relevant to this journal.

If we now set aside issues of epistemology, we can turn to the internationally agreed ethical principle, the Precautionary Principle. This principle states that where there is good reason to believe that particular processes generate risk of serious or irreversible harm, preventive action should be taken in advance of universal scientific consensus. There are certainly weaker versions of this principle, which specify just that the absence of universal scientific consensus should not be treated as a reason against preventive action. This weaker version, which was upheld at the Rio Summit of 1992, allows that there could be other reasons against preventive action, one of which might be that the cost of such action would be prohibitive. But not all policies of climate change mitigation and adaptation involve prohibitive costs. Hence, the weaker version of the principle, which all the world's countries represented at Rio accepted, is potentially applicable to the issue of climate change.

Even those not convinced that climate change is both real and anthropogenic can hardly fail to accept that there are strong reasons to accept that the processes that are widely held to contribute to such climate change pose real threats of harm both to humanity and to other species. The threats posed include rising sea-levels, as ice-sheets fall into the oceans, with threats to the world's coastlines and small islands (some of which are already having to be evacuated). They include increasingly frequent and increasingly intense weather events, including hurricanes, floods, droughts and wildfires. They include the spread of the vectors of disease, both in altitude and in latitude, as well as the polewards movement of habitats, placing numerous species at risk of extinction. Even if one is not convinced that climate change is both real and anthropogenic, one can hardly refuse to accept that the Precautionary Principle is satisfied (because there is good reason to believe that current practices are posing threats of serious and irreversible harm), and that therefore preventive action should be taken, despite the absence of total scientific consensus. One of the reasons why the Precautionary Principle should be recognized is that if it is not, and the threats materialize, it will by then be too late to reverse them.

The playwright Arthur Miller was justified in drawing an analogy (in *The Crucible*) between the Salem witch-hunts of Massachusetts of the seventeenth century and the McCarthyite attempts to purge the United States of Communism. But neither of these phenomena bears comparison with either the conviction that anthropogenic change is going on, or the ethical conclusion that preventive action should be taken. There are at least two reasons for not claiming such analogy. Belief in anthropogenic climate

change is grounded in science, whereas belief in witchcraft and belief in a Communist conspiracy among American intellectuals and celebrities was not. There again, the Precautionary Principle, which is triggered when there are good grounds to hold that certain practices threaten serious and irreversible harm, applies all too clearly to anthropogenic climate change, whereas there was no good reason to believe that witches were endangering American society in the late seventeenth century, nor that Communists were doing so in the mid-twentieth century.

The arguments here serve to clear the way for the arguments that I was presenting in “Global warming, equity and future generations” in 2010 securing a hearing. In fact I have slightly revised my stance on the ethics of climate change, as may be discovered from the relevant chapter in *The Ethics of the Global Environment* (second edition, 2015), or from the relevant chapter of my much shorter work *Environmental Ethics: A Very Short Introduction* (Oxford University Press, 2018). But it remains that the case that I presented in 2010 deserved a serious hearing, despite the attempt made in the same number to render its assumptions beyond belief.

#### REFERENCES

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