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ENVIRONMENTAL FEEDBACK

A reply to Clive Hamilton

IN HIS REVIEW of *Heat*, Clive Hamilton makes many excellent points, and draws on powerful examples. The image of Texans turning up their air conditioning in order to enjoy a log fire is now printed indelibly on my mind. He correctly identifies the association between consumption and identity, and the threat that the need to tackle climate change presents to the traditional view of progress. I believe he may be right when he says that I have been too harsh in my criticisms of the Kyoto Protocol. But I would, of course, like to contest some of his other claims.

Let me begin—as this underpins all the arguments that follow—by explaining why I have chosen an ‘aggressive target’ for cutting carbon dioxide emissions. Hamilton says that seeking to prevent two degrees of warming above pre-industrial levels is ‘a more ambitious target than most.’ That is not correct. As long ago as 1990, the United Nations Advisory Group on Greenhouse Gases proposed that we should seek to confine the rise to a maximum of 1–2°C.¹ An upper limit of 2°C is the European Union’s stated target, which informs the carbon reductions planned by the UK and most of the governments making serious efforts to tackle climate change.²

There is a good reason for this. Two degrees of warming is the point at which up to 4 billion people could suffer water shortages, crop yields could fall in many regions of the poor world, mountain glaciers disappear worldwide and the irreversible melting of the Greenland ice sheet, which could eventually raise global sea levels by 7 metres, is expected to begin.³ It is also the point at which several important positive feedbacks

could be triggered. The permafrost of the West Siberian peat bog, for example, contains 70 billion tonnes of methane, a powerful greenhouse gas.⁴ If all of it were released, its warming effect would equate to 73 years of current manmade carbon dioxide emissions. The methane that escapes due to melting would accelerate global warming, melting more permafrost, which releases more methane. A two-degree rise in temperatures could cause the runaway warming of permafrost throughout the Arctic Circle.

For this and other reasons—including the die-back of tropical forest, the accelerating metabolism of soil bacteria, a reduction of the earth's reflectivity as ice melts—two degrees of manmade warming could cause a total impact of three degrees; and three degrees could lead inexorably to four. In other words, if two degrees of warming takes place, the problem is snatched from our hands. The biosphere becomes a major source of greenhouse gases, and there will be little we can do to prevent further climate change. Two degrees is the only target worth setting.

But while governments might agree that we should strive to keep temperatures below this threshold, they and their advisers fudge the means by which this should be done. Sir Nicholas Stern, for example, spells out the dire consequences of two degrees of warming. He then recommends a target for atmospheric concentrations of greenhouse gases of 550 parts per million, when measured as 'carbon dioxide equivalent' (CO₂e). Stern admits that this concentration would produce 'at least a 77 per cent chance—and perhaps up to a 99 per cent chance, depending on the climate model used—of a global average temperature rise exceeding 2°C.' It would also give us a '30–70 per cent' chance of exceeding 3° and 'a 24 per cent chance that temperatures will exceed 4°C'.⁵

¹ Frank Rijsberman and Robert Swart, eds, *Targets and Indicators of Climatic Change: Report of Working Group II of the Advisory Group on Greenhouse Gases*, Stockholm 1990.

² Council of the European Union, Information note 7242/05, 11 March 2005.

³ These projections are taken from the Meteorological Office, *International Symposium on the Stabilization of Greenhouse Gases*, April 2005, table 3: 'Major Impacts of Climate Change on the Earth System'; Sir Nicholas Stern, *The Economics of Climate Change*, Cambridge 2006; the Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis*, February 2007.

⁴ Fred Pearce, 'Climate warning as Siberia melts', *New Scientist*, 11 August 2005.

⁵ Stern, *Economics of Climate Change*, pp. iii, 295.

In other words, 550ppm CO₂e is the wrong target, as Stern must know. He is not alone. At a meeting I attended in 2005, Sir David King, the British government's chief scientist, proposed that a 'reasonable' target for stabilizing carbon dioxide in the atmosphere was 550ppm CO₂ (which means approximately 630ppm CO₂e). It would be 'politically unrealistic', he said, to demand anything lower.⁶ Simon Retallack from the Institute for Public Policy Research reminded Sir David that his duty is not to convey political reality but to represent scientific reality. King replied that if he recommended a lower limit, he would lose credibility with the government. It seemed to me that his credibility as a scientific adviser had just disappeared without trace.

So while two degrees remains the nominal upper limit, repeatedly cited by government ministers, politics, not science, informs the carbon reductions they propose in order not to exceed it. The calculations I explain in *Heat*, which any numerate person can replicate, estimate the cut demanded by the science. Hamilton says that the result—a worldwide reduction of 60 per cent—is 'far beyond the cuts proposed by anyone else'. This is also incorrect. A paper published recently in the journal *Climatic Change* shows that in order to obtain a 50 per cent chance of preventing the global average temperature from rising by 2° above its pre-industrial level, we require a global cut of 80 per cent by 2050.⁷

Carrot juice and wishful thinking

Having tried to identify the reduction the science demands, I then seek to discover how it could be implemented. This, rather than a determination to be 'audacious', is what leads me into conflict with other environmentalists. If, as I believe we must, we are to place the effort to prevent runaway climate change at the top of the political agenda, we will have to make some hard choices. A 90 per cent cut across the economy of rich nations will require a cut of approximately 90 per cent in every major sector. If, for example, the carbon dioxide produced by land transport, which currently accounts for 22 per cent of the UK's emissions,

⁶ Sir David King, speech to the 'Decarbonizing the UK' conference, Westminster, 21 September 2005.

⁷ Nathan Rive et al, 'To what extent can a long-term temperature target guide near-term climate change commitments?', *Climatic Change*, vol. 82, nos 3–4 (2007), pp. 373–91, Table 1.

were to be reduced by only 50 per cent, emissions across the rest of the economy would have to be cut by 98.2 per cent. While I believe that 90 per cent is just within the realm of political possibility, 98.2 per cent lies well beyond it. We cannot afford to favour any sector.

Anyone seeking a 90 per cent cut in the emissions produced by electricity suppliers quickly runs into a complex and intractable problem. Unlike most of the other commodities we buy, which can be stockpiled and then delivered when we want them, electricity—being difficult and expensive to store—must be produced at the very moment of demand. If either too much or too little is generated, the voltage and frequency fluctuations will crash the country's computers. If supply falls below a certain level, the whole system collapses. Not only must it be made when we want it, it must also be made in precisely the quantities we ask for.

Like other environmentalists, I would be happiest if all the electricity on the grid were supplied by means of renewable energy. But the wind does not blow, the waves do not rise and the sun does not shine on demand. In the UK, for example, electricity demand peaks between 5pm and 7pm on winter evenings. Those who advocate turning the UK into a solar economy would do well to take note of this. If we switched our entire electricity-generating network over to variable sources of renewable power, there would be a power cut whenever the wind or waves dropped. There are a few 'non-variable' renewable sources, such as biomass and geothermal energy, but their supply is limited (except in Iceland). Though the research on this issue is sparse, it appears reasonable to assume that a maximum of 50 per cent of any electricity supply can be produced by renewables. So where is the rest to come from?

Hamilton does not tell us. He tells us only what he does not like: carbon capture and storage. But if electricity users are not to be subject to repeated blackouts and equipment failure (which would make our proposals politically unfeasible), the question must be answered. Unless we discover a magical new source of fuel, it comes down to an unfortunate choice between nuclear power and burning fossil fuel with capture and storage.

I am less hostile to nuclear power than I used to be. I no longer believe that uranium is about to run out or that the safe disposal of nuclear waste is impossible. But every state which has sought to develop a nuclear

weapons programme since the non-proliferation treaty was signed—Israel, South Africa, India, Pakistan, North Korea, Iraq and Iran—has done so by diverting resources from its civil nuclear programme. Like most of the world’s people, I would like to see complete multilateral nuclear disarmament. This is almost impossible while fissile materials are still processed for use in nuclear power stations. Eisenhower’s programme for beating the nuclear sword into the nuclear ploughshare has achieved just the opposite.

So I place nuclear power second on my list of preferences. My first choice is the burning of natural gas with carbon capture and storage, and my third the burning of coal with CCS. Hamilton calls carbon capture ‘a political ruse first and foremost’, but the real ruse is to pretend that no ugly technology has to be selected: that a modern economy can be run on carrot juice and wishful thinking. He argues that carbon and storage is ‘likely to be more expensive than existing alternatives’. Which alternatives does he have in mind? If you want to generate large quantities of non-variable, low-carbon electricity, there is only one. Is he quietly endorsing nuclear power? If so, he should tell us, and be bold enough to take some of the flak that anyone prepared to make this tough choice attracts.

I have often noticed a hostility among environmentalists to technological solutions that permit industrial processes to continue. I cannot help wondering whether this accounts for Hamilton’s preference for my chapter on aviation, in which I discover that there is no technological answer to the problem, over my chapters on housing, electricity, heat and land transport, in which I find that there are solutions.

Death and taxes

Now I must enter the real shark pool: the economics of climate change. It would be polite to say that they are uncertain, more accurate to say that in most cases they are bogus. The calculations Stern uses, for example, are nonsensical. On one side of the equation are the costs of preventing climate change, most of which take the form of investments in new technologies and disinvestments from old ones. These are quite easily quantified. On the other side are the costs of climate change. Some of these are financial—food prices could rise, sea walls will need to be built. But most of them are costs which have hitherto been regarded as

incalculable: the destruction of ecosystems and human communities; the displacement of people from their homes; disease and death. These are all thrown together by Sir Nicholas with a formula he calls 'equivalent to a reduction in consumption', to which he then attaches a price. The global disaster unleashed by a 5–6° rise in temperature is 'equivalent to a reduction in consumption' of 5–20 per cent.

In what way is it equivalent? It is true that as people begin to starve they will consume less; when they die they cease to consume altogether. I can accept that a unit of measurement allowing us to compare the human costs of different spending decisions might be necessary. But Stern's unit—a reduction in consumption—incorporates everything from the price of eggs to the pain of bereavement. He then translates it into a 'social cost of carbon', measured in dollars. He has, in other words, put a price on human life. Worse still, he has ensured that this price is lost among the other prices: when we read that the 'social cost of carbon' is \$30 a tonne, we don't know—unless we read the whole report—how much of this is made of human lives.

This methodology leads to a disastrous consequence, unintended but surely obvious. Stern's report shows that the dollar losses from failing to prevent a high degree of global warming outweigh the dollar savings arising from not taking action. It therefore makes economic sense to try to prevent runaway climate change. But what if the result had been different? What if he had discovered that the profits accruing from burning more fossil fuels exceeded the social cost of carbon? We would then find that it makes economic sense to kill people.

Ridiculous as this sounds, it was, in effect, the conclusion of another report commissioned by the UK Treasury, written by the former chief executive of British Airways, Sir Rod Eddington.⁸ Asked to advise the government on the links between transport and the UK's economic growth, Eddington found that even when the costs of climate change, as calculated by Stern, are taken into account, the total costs of expanding the UK's airports and road networks are lower than the amount of money to be made. Though he never spelt it out in these terms (I can find no evidence in his report that he has even understood the implications), Eddington discovered that

⁸ HM Treasury, *The Eddington Transport Study*, December 2006.

it makes economic sense for other people—mostly Africans and Asians—to die in order that we in the developed world can travel more.

So when I mock the Department of Transport's suggestion that the aviation industry should 'pay the external costs its activities impose on society at large'⁹ by asking whether a steward should be sacrificed every time someone in Ethiopia dies of hunger, I do not think it is fair to call this a cheap shot. It is a deeply serious point. Like Stern and Eddington, the Department appears to believe that it can cost human life, and that this cost can be discharged by paying a certain sum in pounds or euros. I find this formula both fanciful and repugnant.

The aesthetic fallacy

Hamilton misrepresents the reasons I give for choosing one system of financial incentives over its competitors. I do not argue that 'the European Emissions Trading Scheme is flawed because it allows polluters to avoid cutting their carbon emissions, by paying others to cut theirs'. I believe that trade of this kind is necessary if initial cuts are to be expedited. I argue that it is flawed because it is an act of enclosure. By handing out CO₂ emissions permits, free of charge, to the European companies that pollute most, it ensured not only that the polluter was paid, but also that something which belongs to all of us—the right, within the system, to produce a certain amount of carbon dioxide—was given to the corporations.

I favour carbon rationing because it is a much fairer scheme: it allocates an equal entitlement to pollute to all people. One plausible scheme would ration 40 per cent of the national carbon target equally between citizens, purely for buying fuel and electricity. The other 60 per cent would be auctioned to companies for the same purpose, and all allocations would be tradeable.¹⁰ Those who use less than their entitlement can sell the surplus to those who use more. As, by and large, the poor use less energy than the rich, it is likely to result in a redistribution of wealth. Energy taxes, by contrast, hit the poor hardest. It is true, as Hamilton contends, that this proposal 'would again allow rich

⁹ Department for Transport White Paper, *The Future of Air Transport*, December 2003, p. 10.

¹⁰ Devised by Mayer Hillman and refined by David Fleming; see *Heat*, p. 45.

lifestyles to continue, largely unimpeded'. But my scheme for tackling climate change has only one purpose: to tackle climate change. It must be fair and progressive, because that is what would make it politically plausible. But it is not an attempt at social engineering. Let us hammer the rich by other means, but let us not confuse this programme with an attempt to cut carbon emissions. Fighting global warming is hard enough already.

Is it true that I over-emphasize people's failure to do more to reduce their own greenhouse gas emissions? I think, if anything, I understate it. Even if I were to strip out the occasional flights I take—hypocritically or paradoxically, depending on your point of view—in order to speak about climate change in other countries, and even though I cycle and take the train, my own emissions are three or four times higher than the sustainable level. And I do better than most environmentalists. The middle-class greens I know still fly to the Canaries for their holidays. One environmentalist flies from the UK to Thailand to have his colon irrigated. Others drive ancient Volvos or sporty convertibles. Some of them have not even bothered to replace their incandescent light-bulbs. We are all stinking hypocrites.

It does not matter whether we burn fossil fuels with malice or with love. As far as the atmosphere is concerned, it is not concerned. It is a collection of gases. Either we contribute to the total volume of some of these gases or we do not. What I see among most 'caring' people is mere tokenism. They might buy eco-friendly washing-up liquid and organic cotton pyjamas, but they still consume as much fossil fuel as their incomes allow. This is why we require a total cap on national carbon emissions, and a system—such as carbon rationing—for distributing them. Hamilton describes this analysis as 'holier-than-thou moralizing'. I see it as confronting some uncomfortable truths.

I do not mean to sound rigid. But the constraints—technical, economic, social and political—which affect our ability to crack this problem are tight. We cannot afford to accommodate special interests and other agendas. We must not succumb, as many environmentalists do, to the aesthetic fallacy: choosing those solutions which appeal to their tastes and beliefs, rather than those which work best. Nor should we extrapolate from our own experience. The environmental press is swarming with people (most of whom live alone) who claim to have reduced their

own emissions to the desired level, then demand that everyone else follow their example—unaware that self-enforced abstinence is both ineffective and, for most people, unattractive.

Except for when he rejects carbon capture and storage, I do not accuse Hamilton of any of this. His contribution to our understanding of environmental politics has been felt all over the world, and his essay enhances our understanding of the problem. To identify the best means of preventing runaway climate change, our proposals and methods must be debated fiercely. Our criticisms of unfeasible solutions should be severe. But we have so little time.