

# A Reasonable Frugality\*

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1. I begin with a citation from *Our Final Century*.<sup>1</sup> Its author is Sir Martin Rees, the current President of the Royal Society.

A race of scientifically advanced extra-terrestrials watching our solar system could confidently [have predicted] that Earth would face doom in another 6 billion years, when the sun in its death throes swells up into a 'red giant' and vaporizes everything remaining on our planet's surface. But could they have predicted this unprecedented spasm [visible already] less than half way through Earth's life – these million human-induced alterations occupying, overall, less than a millionth of our planet's elapsed lifetime and seemingly occurring with runaway speed? ....

It may not be absurd hyperbole – indeed, it may not be an overstatement – to assert that the most crucial location in space and time (apart from the big bang itself) could be here and now. I think that the odds are no better than 50-50 that our present civilization on Earth will survive to the end of the present century without a serious setback....

Our choices and actions could ensure the perpetual future of life... or, in contrast, through malign intent or through misadventure, misdirected technology could jeopardize life's potential, foreclosing its human and post-human future.<sup>2</sup>

So, where the earth is concerned, what line of action will humanity pursue? At the end of his first chapter (page 24), Rees describes a position he calls realism, according to which the best prospect of our surviving beyond a century is for 'all nations [to] adopt low risk and sustainable policies based on present technology'. That is one kind of realism, he remarks, but another sort of realism says that policies such as these would:

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<sup>1</sup> William Heinemann, London 2003.

<sup>2</sup> Ibid, 7–8.

require an infeasible brake on new discoveries and inventions. A more realistic forecast is that society's survival on Earth will, within this century, be exposed to new challenges so threatening that the radioactivity level in Nevada thousands of years from now will seem supremely irrelevant.<sup>3</sup>

Indeed ... we have been lucky to survive the last fifty years without catastrophe.

2. But what about policy? The first kind of realism, if it were to be translated into a way forward that was saner and safer than either of the two realisms that Rees describes, would have to cultivate new technologies studiously – though not in the spirit of the second possibility that Rees describes, where technology comes loose (one might say) from essential needs. Aspiring only to encourage others to think further about such a median policy, I shall point out (towards the end) that there are all sorts of things that we have incontrovertibly good reasons to alter in our present way of living, reasons independent of ecological considerations. I begin by arguing that, once the ecological threat to human civilization becomes yet plainer and the prospect comes into focus of a world population of nine billion, Rees's two realisms will have to coalesce in a perception of our environmental circumstances that is less dismissive of Malthusian warnings than the cheerful rebuttals and wild past-to-future extrapolations you will find in the textbooks. More specifically though – and here I move towards the particular case where I want to begin – these attitudes or outlooks will have to come together in an all-embracing effort (of reflection, discovery, invention and funding) to free us from our dependence upon setting fire to carbon and releasing it into the atmosphere.

Assertions such as this last are apt to provoke either a feeling of fatigue that long antedates recent events in Copenhagen or outright disbelief – or else the blind anger that comes upon us from feelings of utter helplessness. But, in this paper, having set out the scientific argument that I accept for the claim concerning carbon-dependence, I shall dissent from some of the received responses to it. In their place, I shall describe a position that accords better (I believe) with a new perception of our true circumstances and better (I believe) with that which human beings can become ready to will and to do.

<sup>3</sup> The state of Nevada contains the nuclear waste dump for the USA.

3. The burning of fossil fuels<sup>4</sup> increases the carbon dioxide-concentration in the atmosphere. Carbon dioxide absorbs the infrared radiation which is sent out from the earth, and this raises the temperature at which the earth is in thermal equilibrium with its surroundings. As a result, land and sea rise gradually in temperature. On the level of theory, this process (sometimes described by an analogy with the way in which a quilt traps heat and slows its escape from one who lies beneath the quilt) has been understood since well before the twentieth century (by the labours of Joseph Fourier, John Tyndall and Svante Arrhenius). On the level of observation and reconstruction (from tree rings, ice-cores, etc.), it is now known that since 1769, when James Watt patented the steam engine, carbon dioxide concentration in the atmosphere has increased from 280 parts per million to more than 380 parts per million. It is now increasing at more than 2 parts per million every year. Looking forward upon this rate of increase, it is expected that, when the 1769 concentration of carbon dioxide<sup>5</sup> is doubled, that will have the same eventual effect as increasing the intensity of the sun by at least 2 percent and raising global mean temperature by at least 3 degrees.<sup>6</sup> Among the likely consequences are a rise in sea levels which will be simply calamitous for many millions of coast dwellers; the misery of millions upon millions of refugees; serious and unpredictable (already incipiently evident) disruptions of the seasonal patterns on which farming and much else depends; greater frequency of hurricanes and other high energy weather events; and the shrinkage or disappearance of numerous glaciers that supply the rivers upon which some billions of human beings have largely to rely for fresh water...

These predictions arise from a larger picture that places the 26 gigatons of CO<sub>2</sub> per annum that our burning of fossil fuels adds to the atmosphere alongside the 440 gigatons the rest of the biosphere emits and the 330 gigatons the oceans add to it. These other emissions belong to a cycle that long pre-existed human emissions. Within that

<sup>4</sup> Here I shall lean not upon Rees, whose preoccupations cover a much wider area, but upon chapters 1 and 31 of David J. C. MacKay's book *Sustainable Energy without the Hot Air* (UIT Cambridge Ltd, 2009).

<sup>5</sup> And of other gases, CFCs, HFCs, methane, nitrous oxide etc., as measured in terms of the number of molecules of CO<sub>2</sub> it would require to produce the same greenhouse effect. Taking these into account the current figure is not 380 but 400.

For another way and importantly different way of looking at the link between CO<sub>2</sub> emissions and global temperature, see Myles R. Allen *et al.*, pages 1163–6 in *Nature* **458** (30 April 2009).

<sup>6</sup> MacKay, 10.

cycle, flows of carbon out of soil, vegetation or atmosphere more or less balanced flows into soil, vegetation or atmosphere, even as the atmosphere equilibrated with the surface waters of the oceans.

Such were the conditions under which, long ago, human civilization came into being. The thing that is relatively new is the imbalance between the CO<sub>2</sub> being emitted into the atmosphere from fossil fuels etc. and the CO<sub>2</sub> that is taken up from this by the forests and oceans.<sup>7</sup> It has been suggested that, as things are now, roughly half of the CO<sub>2</sub> emissions from our burning of fossil fuels are staying in the atmosphere. But even that figure gives a poor basis for extrapolation into a future where there will be less rainforest and the acidification of the oceans is likely to have diminished their capacity to take up CO<sub>2</sub> from the atmosphere. Some such diminution appears already in a 40% decrease in plankton since 1950.

Human life as we live it is slowly but surely disrupting the conditions that make that life possible. So much is more certain than any specific meteorological or geographical prediction can be. The things that are almost beyond dispute are, first, that CO<sub>2</sub> in the atmosphere is already at a concentration never exceeded at any time in the last 400,000 years; second, that the atmosphere's capacity to carry CO<sub>2</sub> (relatively) safely is comparable in its way to any other natural resource. It is at once precious and exhaustible.<sup>8</sup>

4. If economic theory or 'ethical theory' as we now have it find difficulty with the question how much any of this must matter to us – living as comfortably as we do here and now in the cheerful way that is natural to us, then so much the worse, I say, for these forms of 'theory'.

Each of us knows that our concerns with other human beings are not confined to ourselves or our own offspring. We are disturbed, for instance, if we perceive that something we are doing will either deprive other people of that in which they reasonably expect to share or else endanger them seriously.<sup>9</sup> It need not matter who these people are. Wherever we can see how to do so, moreover, we

<sup>7</sup> MacKay, 242.

<sup>8</sup> Indeed we are well on the way to the point where, with the burning (say) of the trillionth tonne of CO<sub>2</sub>, it will be exhausted and the accumulated emissions will make the earth uninhabitable. See again here Myles R. Allen, *op. cit.*, note 3.

<sup>9</sup> Consider wasting water during a drought. Consider the acts of leaving behind unmarked radioactive waste, unexploded ordnance or landmines or, less perilously, something that people are almost certain to stumble over.

are aware of an obligation to remedy the bad act we have done or to put matters right for the future. But, in so far as that is so, our convictions have long since reached a point where we cannot, consistently with demands that we already recognize, be indifferent to the damage that we do to the biosphere. After all, we have only to rehearse to ourselves the thought that the biosphere is something we inhabit in common with others who rely upon it no less than we do, either directly or indirectly, for the satisfaction of their every vital need. This last idea, already evident in old invocations of a mother earth the provider, surely lies close to the origin of an ordinary human concern for the earth.<sup>10</sup>

For many or most people, however, the concern for the earth goes further still:

My mother was certainly not an environmentalist in the way we would understand the concept today, but she knew the beauty of nature when she saw it and how it made her feel. My mother told me a story of when she was a young woman. She used to walk through the forests from Nyeri to Naivasha on the western side of the Aberdare range [in Kenya]. As she walked she crossed numerous tributaries of the Gura River which I could hear from our house in Ihithe when I was a child. The Gura and all the other tributaries, known collectively as Magura, flowed down the Aberdares and my mother told me they were teeming with trout. Kikuyus didn't eat fish at that time so there was no fishing. But she and her friends would rest by the streams, watch the trout, and marvel at how beautiful they were.

My mother is gone, as are many of those rivers and with them the trout and a way of life that knew and honoured the abundance of the natural world. Now, because of the devastation of the hill-sides [by logging or conversion to cash crops], instead of rivers there are only little streams and the Gura River no longer roars. Its waters don't pass over the stones so much as seep into the riverbed, and even when I stand next to it, the river says nothing ... its roar has slowly been silenced.<sup>11</sup>

<sup>10</sup> Cf. Hume's comparison at *Enquiry Concerning the Principles of Morals*, section VI, part 1, ad fin. '...the happiness and misery of others are not spectacles entirely indifferent to us... the view of the former, whether in its causes or effects, like sunshine or the prospect of well-cultivated plains communicates a secret joy and satisfaction.' The comparison works both ways.

<sup>11</sup> Wangari Maathai, *Unbowed: One Woman's Story* (Heinemann, 2007, London), 275–6.

I cannot of course be certain that absolutely everyone will respond to such words in the way in which I find myself doing. What *is* certain is that, if we will not invest the biosphere itself with a significance transcending our concern with the fate of particular people (as well as see its present and future resources as a matter of concern in which all mankind will have to share), then we shall be strangers to the only frame of mind that offers any chance of humanity's evading Rees's gloomy predictions. (See below section 17.) This is not to say that nobody can refuse to invest the earth with the significance that one finds implicit in Maathai's utterance. It does however require considerable sophistication – or else single-mindedness of a special kind – to refuse to do so.

Among economists and philosophers of a consequentialist or quasi-utilitarian bent, there is a tendency to suppose that the practical problem Rees describes is to be understood in terms of the 'net present value' (that is the value estimated now on the basis of its temporal distance from now) of the income streams of future generations. I shall return at the end of section 9 to the internal difficulties of any such view. But here, in advance of those difficulties, I want to complain against it, first, that the economic view depends on the highly questionable idea that our concern with the earth is exhausted by our concern for human welfare.<sup>12</sup> My second and more general complaint, which prescind entirely from the first complaint, is that any such view has the effect of making the care that we owe to the condition of the earth come down to a question of our altruism or benevolence towards those whom the earth will have to support. It comes down to that because, when the net present value is to be determined of those future income streams, the question then becomes: what should be the rate of discount? Shamed by Frank Ramsey who challenges us to consult our imaginations,<sup>13</sup> shall we adopt a zero rate of discount? Or, cleaving to the dictum of Aristotle at *Nicomachean Ethics* 1168b8, shall we insist that the knee is closer than the shin? And if we prefer Aristotle, then what discount rate are we to

<sup>12</sup> Compare Wangari Maathai, quoted above; compare Bernard Williams 'Must a concern with the environment be centred on human beings?' in *Making Sense of Humanity* (Cambridge, 1995); and my 'Nature, respect for nature and the human scale of values', *Proceedings of the Aristotelian Society* 100 (corrected text to be found only in the bound volume), 2000.

<sup>13</sup> Compare Frank Ramsey 'Discounting is a practice which is ethically indefensible and arises merely from weakness of the imagination', in *Foundations: Essays in Philosophy, Logic, Mathematics and Economics*, ed. D. H., Mellor, (RKP, 1978), 261.

choose? How much benevolence must we expect of ourselves? What is the 'rational' way of answering such a question? Or are these the wrong questions?

The objection I want to bring against all of this is that we are losing hold of the real point. The thing that is wrong with despoiling the earth, like the thing that is wrong with doing positive harm to others, has almost nothing to do with failure in positive benevolence or altruism.<sup>14</sup> After all, there is nothing wrong with being indifferent to a person to whom we have no relation or tie. That does not make it all right gratuitously to wound a person we do not care about, to kill him or to destroy that whereby he lives. Where benevolence is concerned, we have relatively few not specifically contractual *duties* and almost everything is properly subject to Aristotle's dictum. But (as Aristotle knew) that leaves over countless other duties – the negative ones, without which, if they were not recognized, human life would be almost unrecognizable. In continuity with this, I suggest that, on any sensible view, most of our obligations to the civilization of the future and to the future condition of the earth itself are essentially negative and prohibitive. They concern what we must *not* do. The earth is not ours to despoil or to do what we like with. Our benevolence or lack of it has almost nothing to do with the matter. (For more on the content of the negative duty, see below section 8.) Ramsey and Aristotle make very different claims, but there is no real conflict between them.

You may ask how a morality such as the ordinary morality that I am appealing to, and which I seek to ground in familiar human concerns and feelings, can advance so far beyond the immediate reach of those concerns and feelings. I reply by agreeing that it is indeed human concerns, feelings and prohibitive aversions (these last insufficiently explored by Hume) that give us our first understanding of values and obligations. It is these things which, by the aid of reason (as Hume insisted), furnish us with the wherewithal to arrive at a Standard of Morals.<sup>15</sup> (The phrase is Hume's.) Once we explore these concerns and feelings, moreover – and once we permit them to extend themselves, if they will, to the biosphere itself – sentiment and reason

<sup>14</sup> See my 'Solidarity and the Root of the Ethical', *Tijdschrift voor Filosofie*, 71/2009, 239–269, developing what I say in *Ethics: Twelve Lectures on the Philosophy of Morality*, Penguin and Harvard, 2006. See pages 11, 15 and the Index sub 'prohibitive aversions'.

<sup>15</sup> I enlarge upon all this at *Ethics: Twelve Lectures*. See pages 46–50, 11–12. For one of Hume's claims concerning the role of reason, see (for instance) *Enquiry into the Principles of Morals* V, part 2, footnote.



can combine to force us to think much harder about the harms we ought not to do, either to others or to the earth. Where the habitability or beauty of the earth are concerned, moreover, the demand that I say we ought to find growing upon us is to act as if human civilization and the habitable earth have an entirely open future – even if the best we can do is to delay, as if indefinitely, their destruction or demise.

5. In the face of these findings and all the responsibilities that flow from them, what are human beings now thinking and doing?

At the 2009 Summit meeting in Copenhagen, there was general agreement that steps should be taken to limit any further increase in global temperature to below 2 degrees. This was widely taken to mean limiting emission of greenhouse gases to the CO<sub>2</sub> equivalent of 500 parts per million, which is the halfway point in the 450–550 range proposed in the 2007 *Stern Review on the Economics of Climate Change*.<sup>16</sup> (Some countries wanted a ceiling far below 500 and Stern himself now favours a limit of 450 ppm.) Despite that consensus, however, it proved impossible to arrive at ‘legally enforceable’ international treaty to replace the Kyoto protocol which expires in 2012.

Such a treaty might perhaps have come into being if some sufficiency of First World countries had been prepared to offer Third World countries something along the lines of the ‘contraction and convergence’ proposals advocated by the Global Commons Institute.<sup>17</sup> This would have involved drawing up a ‘contraction budget’ for greenhouse gas emissions and assigning entitlements to each country on the basis of its population in a baseline year, agreeing at the same time two dates – a date by which the entitlements of all countries would converge to being equal per capita (relative to the baseline year) and a further date by which there would be no further increase in the carbon concentration of the atmosphere. It would have been a question whether the United States negotiators were in a position to promise a treaty.<sup>18</sup> It would have been a question whether Third World countries would persist in the objection that,

<sup>16</sup> In effect, the UK committee on climate change aims not to do better than to respect this limit. See Stephen Plowden, ‘Trust the People on Climate Change’, *Oxford Magazine*, no. 299, Trinity Term 2010, 4–5.

<sup>17</sup> See Aubrey Meyer, *Contraction and Convergence: The Global Solution to Climate Change*, Schumacher Briefing No. 5, Green Books, Dartington, Devon. See also Aubrey Meyer, ‘The Case for Contraction and Convergence’, 29–56, in *Surviving Climate Change*, ed. David Cromwell and Mark Levane (Pluto Press, London 2007).

<sup>18</sup> In 2008 the US administration did try to offer the rest of the world an 80% reduction in CO<sub>2</sub> emissions by the year 2050. It put legislation before



even under this proposal, there is insufficient recognition of their substantial innocence of the noxious emissions that have brought the atmosphere to its present state. But in the end, even the simple but fundamental thoughts that prompt such proposals were effectively obscured.

In Europe after Copenhagen one might have hoped that, with the question of convergence adjourned, the emphasis could shift to absolute contraction. Yet the main focus is not upon absolute contraction. Still less is it upon allowing the necessity for that contraction to impinge at full force upon the awareness either of the public at large or of policy makers. In Britain at least, the focus is upon the mechanics of 'cap and trade' (see section 6 below); it is upon the endlessly debatable subtleties of discounting (8 below); and, distracting attention and resources from urgent research or development, it is upon the so-called Renewables Obligation (9 below). Each deserves some commentary.

**6.** The first distraction from the urgency of absolute reduction – the reality of contraction, I mean, all sources included – is a fixation upon its simulacrum. It is upon the merits, scope and detailed workings of a system of 'carbon trading' – 'cap and trade' – already in partial operation, which requires larger companies whose activities involve substantial emissions either to reduce emissions or else to buy 'carbon credits' to a value proportionate to those emissions. The claim is that, by making carbon credit 'tradeable', the scheme directs new resources to wherever carbon intensive activities can best be modified or replaced. The claim is that, given a cap upon emissions, the trading scheme identifies the most efficient way of containing emissions within that cap.<sup>19</sup> The words 'the most efficient way' mean here the way of staying below the cap that costs least in respect of human 'income'.

Was this scheme worth the ten or more years of effort it took to develop and gain favour for it? I think – and I said at the time –

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Congress to achieve this. The legislation passed the lower house but was rejected by the Senate.

<sup>19</sup> Analogous claims were plausible enough when made on behalf of the US Environmental Protection Agency's cap and trade scheme for controlling sulphur dioxide emissions. This was the endlessly fascinating Coasean paradigm for the EU and UN carbon trading scheme. But, depending as it did on the surveyability of a relatively restricted field of operation and a uniform rule of law under a single sovereignty, it is a strikingly poor paradigm for a worldwide system of carbon trading. Indeed, even within one territory, the surveyability problems relating to CO<sub>2</sub> emissions and SO<sub>2</sub> emissions are of altogether different orders of magnitude.

that these years could have been more properly spent in arriving at a better public appreciation of the possibilities for a civilization that made fewer demands on the energy we derive from carbon, not in circumventing the need for this better appreciation. But advancing now to the particular merits or demerits of carbon trading, I remark that it makes a difference whether one supposes that there is a global cap upon emissions or one supposes that it is for each country to determine its own cap.<sup>20</sup>

If each country fixes its own cap but is empowered to issue carbon permits which are valid everywhere, that is likely to prolong and diversify the kinds of exploitation and abuse in which carbon trading and the 'Clean Development Mechanism' have already been so heavily implicated.<sup>21</sup>

If, on the other hand, there is a global cap and efforts are made to see that it is globally enforced – a managerial fantasy perhaps, and pregnant with sinister possibilities, to judge by the way in which the World Trade Organization is reported to have impinged upon some of the poorest among Third World countries – then carbon permits will rise steadily in price to match the severity of the cap. But that will not prevent the richer nations from protecting some of their most wasteful and irresponsible uses of fossil fuels. Rather than modify their emissions substantially, they will see the opportunity to pay poorer nations to reduce *their* emissions. (For any abatement is equivalent to any other abatement given similar reductions of CO<sub>2</sub>. That is the doctrine.) The efficiency that is claimed for carbon trading is blind to the difference between wasteful activities and (emission-equivalent) activities which are indispensable or nearly indispensable as things are at a given time to human life at that time.<sup>22</sup> To this extent carbon trading is blind to opportunities

<sup>20</sup> Gareth Jenkins made me see the importance of distinguishing these cases and helped me to demarcate the two objections that follow.

<sup>21</sup> For recent reportage of some prevalent scams, see page 26 of *The Guardian*, Wednesday 27<sup>th</sup> October 2010. No doubt steps will be taken to counter this particular fraud. Another puncture, another patch. See further 'A realistic policy on international carbon offsets' by Michael W. Wara and David G. Victor, Working Paper 74, April 2008, <http://pesd.stanford.edu>.

<sup>22</sup> This distinction rests on a moral judgment, someone will say. Yes, I reply, but at some point every practical argument in this area has to rest on some sort of moral judgment. Why try to postpone it?

It is a thought too rarely entertained that the methodological requirement to minimize or postpone ethical considerations is not necessarily 'ethically neutral' or promotive of objectivity. Why try to be neutral for as long as

to close down emissions which needlessly and wastefully damage the biosphere (cp. section 4). It is not to be denied that carbon trading makes transfers from richer to poorer nations. But there are many other ways to do this. Some even promise something in return – e.g. the solar energy in which so many poor nations have a comparative advantage. See section 10 below.

Such doubts about cap and trade point in the direction of a further disquiet. The efficiency claimed for cap and trade amounts to its restrictions costing less in respect of human ‘income’/overall marginal satisfaction than any other system for controlling emissions of CO<sub>2</sub>. Even as it stands, this contention is doubtful, in so far as taxes, regulations and prohibitions may reach down to many more wasteful carbon-emitting activities than does cap and trade. (See below, sections 16–17.) More fundamentally though, the unfavourable comparison presupposes that a system to tax and regulate must have exactly the same aim as the carbon trading system. It need not. Tax and regulate may set itself the aim to produce the largest possible absolute decrease in emissions (which may turn out to be a larger decrease than cap and trade will achieve) that is consistent with an ongoing or emergent sense of fairness, at the same time promoting the effort to divert every resource that may be spared from the vital and immediate needs of human life into the business of making green energy affordable enough for it to displace carbon.

Tax and regulate differs politically, practically and motivationally from cap and trade. Unlike cap and trade (in the short term), tax and regulate will depend upon public opinion. In that respect, its advantage lies in its avoiding the abstractions I have criticized in section 6 and its speaking directly to ordinary moral awareness. Cap and trade need not seek either to promote or to engage human awareness of the fragility of the ecosystems on which human civilization depends. Cap and trade does not even seek to ensure that a rise in the price at which carbon trades here and now will amount to sufficient motivation here and now, where delay is indefensible, to speed long-term research and investment into carbon-sequestration at coal-fired power stations such as the economies of China and India apparently depend upon. Compare MacKay page 222. (It is noteworthy that in Britain, where ‘the price of carbon’ has been a talking

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possible between just and unjust or good and evil? As regards the *objectivity* at t of the standards at t of vital need presupposed by judgments of wastefulness, see my *Needs, Values, Truth* (amended Third Edition Oxford, 2002), Essay One.

point for at least 15 years, such research has accounted for an almost negligible fraction of GDP. Is this an accident?)

7. This is as good a place as any to point out how dangerous and lazy is the widespread acquiescence in a limit of 500 or, as some say, 500–550 parts per million. Those who do acquiesce and institutionalize that acquiescence in their determinations of the cap that controls the market in carbon too easily forget the terms in which Jim Hansen and other scientists have described the peril that attaches to settling for any concentration of greenhouse gas emissions beyond 400 parts per million (as measured in CO<sub>2</sub> equivalents). One of their several arguments is this: that, where the permafrost melts, this releases methane, a gas whose greenhouse effect is 21 times more pernicious than that of CO<sub>2</sub>. If such a tipping point is reached, it will be almost impossible to ‘reconsider’ (this is UN speak) the limit chiefly under discussion at Copenhagen or to conceive of ‘long term stabilization’ (this is Stern speak) at a level of greenhouse gas concentration less than the limitation proposed in the *Stern Review*. It is not clear that those who are content to think in terms of 450 or 500 or 550 parts per million have any *scientific* answer to Hansen, or any practical response for the outcome where he is proved right.<sup>23</sup> It would also appear that they are assuming recklessly that ocean and forest will continue to absorb CO<sub>2</sub> from the atmosphere in the same quantities as they do now.

8. The pros and cons of the carbon trading mechanism are not the only distraction from post-Copenhagen realities. Another distraction derives from continuing controversy and confusion concerning not the means but the proximate end itself of present action. A line of policy that is based on the idea that what has to be at issue is the net present value of the income streams of future generations represents a confused and confusing substitute for the simpler and truer perception that we are now at a point in the diminution of natural resources – including the capacity of atmosphere and ocean to absorb CO<sub>2</sub> (relatively) safely, the variety and plenitude of plant and animal species, the fertility of the soil and the purity of our sources of fresh water... where the act of wasting, polluting or destroying these things becomes comparable to the act of raiding or

<sup>23</sup> For one set of responses to Hansen, see Nicholas Stern, *A Blueprint for a Safer Planet* (Bodley Head, London 2009), 150–152, 39. For more on the said acquiescence, see Stephen Plowden, *op. cit.* and Myles R. Allen, cited at note 3 above.

plundering a common store. Conjoining that last claim with the commonsensical finding that we do not know how to live without to *some* appreciable extent diminishing those resources, we arrive, not at a contradiction (neither logic nor ordinary morality nor the two together can turn this conjunction into a contradiction), but at a practical conclusion<sup>24</sup>: we must look always for any means consistent with our ordinary happiness and ordinary justice to reduce our demands upon resources which are not in any realistic sense renewable. In this matter we have to see what we can do, prefer the more sustainable way of living over the less, and profit from the example of countries which find ways better than ours to do these things.

Here (as in sections 4 and 6) it may be complained by persons of a managerial or technical disposition that formulations such as these are too vague to constitute any effective basis for action as they envisage action. (They are too vague for instance to fix a carbon cap.) But the formulations we have used give expression to ordinary ideas that have a clear hold upon us and a dialectical point – a hold and a point that might transfer to the political realm if politicians and statesmen had any trust at all in the democratic process that they praise in other connections. *In a given context* formulations such as these can combine year on year with vague, defeasible but (so far as they go) accurate descriptions of actual states of affairs to yield definite and increasingly persuasive (however defeasible) conclusions in that context.

What then is the way forward? Prescinding from convergence under treaty, prescinding for the moment from all internationalist hopes, and concentrating for the moment on contraction, we might say this: let each country do its own utmost to reduce absolutely what it sends into the atmosphere. By placing taxes upon carbon-emitting activities differentially (lower if they are essential to vital human needs and higher if they are inessential) while forbidding entirely activities that are at once profligate and pointless, let each country secure that end, so far as possible, without damage or detriment to human solidarity.<sup>25</sup> Apart from countries such as Sweden and any other small countries

<sup>24</sup> Some say that *ought* implies *can*. Do they mean that, if I live irresponsibly enough, I can release myself from my obligations to my debtors? A careful statement of the connection between *ought* and *can* will not affect the claim in the text.

<sup>25</sup> More specifically, let the objective be to do everything we find we reasonably can do while respecting so far as possible the ideal that looks always to a state of affairs where each and everyone will want each and everyone else to be protected in his/her efforts to pursue (through means constrained by the same ideal) his/her own most in his/her circumstances unforsakeable vital needs. See here my 'Solidarity', *op cit*, 265.

which are similarly sensible, why has almost every nation supposed that it must wait for every other nation to do something?

By way of reply, someone is sure to assert that it is in the interests of each party that *someone else* reduce emissions. But, on the true view, which can be explained to almost anyone anywhere on the basis of a less impoverished notion of self-interest – and soon will be explained, I hope – it is in the interests of each and all countries that *every possible* reduction in emissions be attempted. For that is the nature of the emergency we are arriving at. On a true view, no nation or country can know when or how it will itself be stricken by the effects of climate change, deterioration of the soil, or of the acidification of the oceans. It is a strange idea of self-interest that makes it nothing better than short-sighted idiocy.

From all this it follows, I conclude, that if we look at things from the viewpoint of an ordinary prudence which does not exclude morality, then the sustainability of the demands that we make on the biosphere ought to be determined by the experience of living responsibly, not stipulated top-down by the fiat of boffins and consultants. If we look at matters instead from the point of view of the kind of ‘theory’ I criticized in section 6, then it will seem we are told that we have first to concern ourselves with the income streams available to our posterity and then (God help us) to adjoin to economic theory another theory, namely the theory of justice – equal concern for all, inequalities only justifiable where they result in a larger benefit for all, especially those who have least... or whatever else is your favourite theory. Once we allow ourselves to be drawn into this line of thinking, however, and we lift the artificial restrictions that frame current studies of the problem, we arrive almost immediately at the question how many more billions than our own billions of people there will then be, enjoying what income stream... in 10 years, 50 years, 100 years, 1000 years... time. Faced with the uncertainty and controversy to which such thoughts lead, one may see the philosophical attractions of some older and more commonplace account of justice, drawing upon a larger plurality of intuitive ideas.<sup>26</sup> This will prompt us to concentrate our thoughts upon the harm or damage we do to our descendants, whoever they may be, if we help ourselves to more than we vitally need of the earth’s resources at risk of prejudicing their renewal or we inflict upon our descendants arrangements that deprive them of all resilience against the kinds of problem that mankind is heir to, water-, energy-, or food- shortage, the passionate hostility of neighbours, armed struggle for natural resources....

<sup>26</sup> For one version of this, see *Ethics: Twelve Lectures*, op. cit. Chapter 10.

9. In countries such as Britain, yet other things have drawn attention away from the duty to reduce emissions absolutely. Among these further distractions I shall mention just two.

The first is the marvellous illusion of absolute contraction already achieved, an illusion that we owe to the fact that, in this country, manufacturing industry has been allowed or encouraged to migrate elsewhere and we rely now upon imports without assuming any responsibility for the emissions that arise from their manufacture.<sup>27</sup>

A second distraction has been HMG's preoccupation with an EU directive requiring every member country to produce at least 15% of its energy by the year 2020 from renewables – and the feeling of intense engagement and prolonged activity against climate change which ministers and their civil servants derive from seeking to meet this target. The target has taken on a life of its own which has come loose from any call for absolute reduction. I do not deny that, in so far as householders have been encouraged (singly or in concert) to contrive their own small-scale wind or solar installations, this interest in renewables has served some extremely valuable purposes. But large-scale projects such as on-shore and off-shore wind turbines with huge connection and construction costs together with massive (recorded or unrecorded) emissions of CO<sub>2</sub> are another matter altogether. Dieter Helm writes:

A study by the National Audit Office has found that the Renewables Obligation 'is several times more expensive than other measures currently being implemented by the government'. Compared with the EU ETS carbon prices in the range £20–£30 per tonne of carbon, the UK renewables programme is staggeringly expensive. Perhaps only the Italian renewables programme looks more expensive. Recently it has begun to be appreciated that current biofuels policy may be even worse – not only in terms of cost, but also in terms of the very limited carbon savings and the impact on agriculture.

The thing that is needed is not a new crop of wind and off-shore schemes but a careful study, not only of the future competence of householders to subsidise these schemes through their payments for utilities, but of the results of a proper carbon audit. What is the *net* saving of CO<sub>2</sub> per kilowatt? How would it compare with the

<sup>27</sup> See Dieter Helm, 'Climate-change policy: why has so little been achieved', *Oxford Review of Economic Policy*, Volume 24, No. 2, 2008, 211–238. I am indebted to this article.



saving that could be effected by interim conversion of power stations from coal and oil to gas?

10. So much for the distractions from real reduction. We come now to the larger picture into which renewables and everything else has to fit.

Focusing on Britain as an example, let me lean again upon David MacKay. In outline, MacKay formulates five alternative energy plans (and then a sixth), insisting throughout that, whatever strategy one considers, the projected supply must measure up to some recognizable summation of the actual demand – unless demand is to be reduced (see section 12 following). Each plan involves some particular combination of clean, carbon-sequestered coal, wind, hydro, wood, nuclear, tide, wave, pumped heat, solar, biofuel, etc.<sup>28</sup> Each plan, dispensing almost entirely with the burning of fossil fuels, involves a near-tripling of electricity generation. Or so it seems *if we treat the demand for energy as a simple given*. Taken in conjunction, Mackay's explorations of these plans point collectively towards a simple conclusion: Britain will never come anywhere close to living by its own renewables. In Britain – as in Europe, MacKay goes on to show – a 'low-carbon economy' would have to depend radically on one, the other, or both of nuclear energy and solar energy, the latter to be purchased (in some just imaginable future) from other people's deserts, e.g. the deserts of the Sahara, and delivered northwards by high-voltage, direct current transmission lines.<sup>29</sup>

On the evidence MacKay provides, it appears nearly impossible, so long as we treat the demand for energy as a simple given, to supplant this conclusion. That is what is so useful about MacKay's analysis and the discipline which insists that the policies should add up to the demand. With heavy heart and the utmost reluctance, the reader of MacKay's book – unless driven (with me) to think that demand itself simply has to be reduced more radically than most of his readers will be ready yet to contemplate – is led to the conclusion that Britain has no alternative but to build one more generation of

<sup>28</sup> It is a pity that MacKay, like Stern, says little or nothing about agriculture and its dependence upon fertilizers derived from fossil fuels, but let us supply this deficit by supposing that they have undergone a quiet conversion to organic agriculture, permaculture or whatever. As the paper goes to press, I note that a United Nations report has aligned itself with the same thinking and claims that this is the way for poor farmers to double their food production claiming that these are in fact the way for poor farmers to double their food production. (Reuters report, March 8<sup>th</sup>, 2011.)

<sup>29</sup> See MacKay, 233, 178–9.

nuclear-power stations. But that could be the last generation, it might still be hoped, if enough technological and diplomatic ingenuity, and enough material resources were to be put into some sort of Sahara plan or some other plan still to be devised.

Speaking personally, I find some consolation for this awful conclusion about the (however conditional) need for nuclear power generation in another thought prompted by MacKay, but not his responsibility. Nuclear and solar apart, small scale domestic or municipal wind power, pumped heat and carbon sequestration of coal-fired power must all be worth persisting in. But, *if there is no alternative to nuclear and nuclear will have to happen anyway*, why persist in wind farms which will alienate (not to say despoil) great stretches of land, will depend forever upon hidden subsidies, and abstract resources from more effective measures? And why persist in offshore wind and wave schemes where unforeseen engineering difficulty and expense can only be increased by the uncertainty of future sea levels?

**11.** Sticking to the need for absolute reduction of CO<sub>2</sub> emissions but at risk of seeming to go backwards, I revert here for one moment to the international scene and Copenhagen (2009).

If what I have said so far is right, then such a summit might have done better to avoid the idea that everything but everything, absolutely everything, depended on the effort to arrive at 'legally binding' agreements concerning future emissions. Negotiations apart, it might have taken the opportunity for the free exchange of ideas. Such a summit might have more time to explore what it would take for the rest of the world to induce, bribe or help Brazil, Paraguay, Guyana, Indonesia, Burma, Australia and other countries with rainforest still standing to treasure and conserve it and to implement a total ban on road-building there. So far as CO<sub>2</sub> is concerned, nothing could be more urgent. Such a ban might at least help to safeguard or prolong the present capacity, such as it is, of the carbon sinks which have served us up to now. Next, without waiting for a binding agreement on any of these things, the First and Second World countries might have expressed their willingness not only to reduce almost all their emissions absolutely (by whatever means they devise) but also to put all their available resources into exploring *with* Third World countries the full variety of technological and political possibilities for the collection and transmission of solar energy. Who knows? Once real progress were made with all that, solar energy might even become cheap enough for African and other countries themselves to desalinate water from the oceans and seek to afforest the desert. That is pure fantasy perhaps. The solid point is that Third World countries would see the prospect of huge capital flows

from the First World to the Third World, and a sustainable rent upon which they could go forward in their own way. (Let us hope or pray that that way will not be a copy of our way.)<sup>30</sup>

**12.** I promised in section 2 to try to say something about how Martin Rees's first kind of realism might be turned into a policy of sustainability, measured risk and the training of human effort upon the ends of life which we can pursue by means of carbon-free enhancements or replacements of present technologies. There is room here for a huge variety of contributions. My own, such as it is, starts out from certain things that reading MacKay makes evident to reflection (and he anticipates at his page 213): namely, the cost at present demand levels of carbon-free energy; the cost – in consumption forgone, natural resources unsustainably consumed or natural beauty destroyed – of wasting energy; and the large unknown potential of that which some environmentalists have called the forgotten fuel. They mean by that the fuel we waste but don't need to waste in pursuing ends we do need to pursue and the fuel we could save in abandoning certain other ends that we might decide to abandon.

**13.** Like so much else that is at issue here, such thoughts involve changes in the way we live now, changes we should consider before they are forced upon us. Above all, they involve examples. In some of the more benign cases, they involve going back to ways of living that were familiar to our mothers and fathers or to our younger selves. In other cases they will involve possibilities we shall have to discover. I begin however with changes which, even now, have much to be said for them, both positively (I mean) and independently of climate change – either because they steer us away from things which seem crazy in their own terms once we see that they result

<sup>30</sup> At a summit rather different from Copenhagen, to which nations came without specific negotiating positions fixed in advance, and where they could listen to one another in a spirit less defensive and more inquisitive, one might have hoped for an open-ended discussion of world population trends and of the unwisdom or idiocy of employment taxes and policies which have the effect of displacing human labour at a time when there is a massive excess of human labour. Attending for a moment to the question of feeding the billions, it might have dwelt on forms of agriculture less dispersive of CO<sub>2</sub> and less destructive of soil than those now generally practised. It might also have attended to the ways in which the world's fisheries are being destroyed by greed and destructive technology, even as the acidification of the oceans not only destroys the plankton on which marine life depends but also threatens carbon sink.

from unsolved co-ordination problems, or else because they help to secure the self-sufficiency and the resilience of regions or localities.

Why do I mention self-sufficiency? Because, even if (despite the grounds Martin Rees gives for pessimism) our present civilization on earth will in fact survive up to 2100, it is a fallacious and gratuitous extrapolation from the prosperity of the twentieth century to suppose that civilization of the future will be exempt from new kinds of economic collapse, exempt from so far (relatively) unfamiliar disputes over natural resources, or exempt from other major disruption issuing in armed conflict, or other upheaval. Why suppose that everywhere some arm of central government will always be in a position to ensure, in whatever way it has so far, that every place have sufficiently secure supplies of money, food, manufactures or other essentials that it now relies upon coming to them from elsewhere? What a pity it is that the political architects in London and Brussels of farming and industrial policy never look beyond the dogmas of 'trade liberalization' to ancient history. Here let me quote from the author of *The Fall of Rome and the End of Civilization*, Bryan Ward-Perkins:

[By 450 AD] the Romano-British population had grown used to buying their pottery, nails and other basic goods from specialist producers, based often miles away, and these producers in their turn relied on widespread markets to sustain their specialised production. When insecurity came in the 5<sup>th</sup> century, this impressive house of cards collapsed, leaving a population without the goods they wanted and without the skills and infrastructure needed to produce them locally. It took centuries to reconstruct networks of specialization and exchange comparable to those of the Roman period. The more complex an economy is the more fragile it is and the more cataclysmic its disintegration can be.

**14.** This matter of self-sufficiency or resilience is closely connected with an example or eminent instance by which I hope to illustrate another inherently desirable kind of change that might in the names of realism and economy be forced upon us by the exigencies of environmental degradation and climate change. I introduce that example with the words of a former captain of industry, Sir Daniel Pettit, speaking as long as 35 years ago, at the Mercedes Benz Conference in Eastbourne, 18–20<sup>th</sup> June 1975:

Responding to the freedom and the new opportunities that road transport has given it, industry has moved steadily away from locations near a railhead, port or inland waterways and has evolved a new, more dispersed approach to Land Use than was

evident in the 19<sup>th</sup> Century with its emphasis on consolidation in metropolis and conurbation. Much new light industry is situated either on industrial estates on the outskirts of established towns, or in new towns. Warehouses in which goods are prepared for final delivery are often located in rural or semi-rural areas where land prices are lowest and supplies of labour are still reasonably consistent and of quality. Research into this area consistently underlines and reflects the irrefutable hold which road transport now has secured over the channels of supply, illustrated by the Mercedes Blue Book and the FTA Handbook and studies in my own organization and the ever-increasing and well justified need for road infrastructure as a prerequisite for growth ... there can be little doubt that growth will continue and, while it will extend the pleasures of increased affluence to more sections of the populations, it will also make more pressing the problems that affluence brings, and highlight the less attractive aspects of the road transport industry as it responds to the increasing demands made on it...

We must give a great deal more thought and determination to developing the concept of the dispersed society, one which in both its appeal to individual liberty and mobility and its use of land is more attuned to the motorcar and the lorry responding to individual needs than the concentration and conurbation developments of the 19<sup>th</sup> century dependent on and conditioned by the railways, providing for the pattern of supply in commodity terms to the population en masse.

When he spoke of the growth and power of the system he was anatomizing, Pettit was a true prophet – as he was when he spoke of the need ‘to give more thought to the concept of the dispersed society’.

To engage with this matter, the contrast we need is not exactly that between the dispersed and the not dispersed but the contrast between a settlement pattern created lengthwise and/or radially by local bus, foot, bicycle or train<sup>31</sup> and a settlement pattern that brings together consumers, producers, workers, employers, goods and services in the manner that Pettit describes (free that is from any of the limitations of older modes of travel), where we end up with a huge

<sup>31</sup> Think, for instance, of ‘Metroland’ – the large area north and north west of London (Baker Street) opened out in the earlier twentieth century to new habitation and new commerce by the Metropolitan Railway. Think how it was *before* the motor car dispersed dwellings and commerce in every direction in the way Pettit describes, gradually filling all the spaces that lay between separate lines and stations.

demand for unrestricted movement in almost any direction, from almost any point to almost any other point.

In the last 20 or 25 years alone, at once enlarging and ministering to that kind of demand, Departments/Ministries of Transport have expended more than £100 billion at current prices on roads and huge further sums I do not know how to calculate on other modes, all in the name of saving time spent on travel.<sup>32</sup> Result: average speeds have risen by 50%. But the average amount of time spent travelling has scarcely altered by more than one minute. It seems that within the duration of the length of time they are ready to spend travelling, people simply rearrange their lives to travel further.<sup>33</sup> It is a fair guess that they are poised to take up any further improvements in just the same way. At the place where they now are, they have new mobility desiderata, no doubt. But, once these are satisfied, others will no doubt replace them. More and more vehicles will continue to get in the way of more and more other vehicles. No wonder that decade after decade transport occupies a larger and larger share of GDP, takes a larger share of natural resources, and pre-empts a larger share of public expenditure...<sup>34</sup>

**15.** There is no need to try to sit in judgment on the individual citizens who respond in this way to new opportunities that lie in front of them. That is not the question. The question relates to changes in our present way of living which might both save carbon emissions and have something positive to be said for them in the present or immediate future. The question relates also to the wisdom or unwisdom of the public policies which have shaped the unconcerted choices that individual citizens make. It is rarely or never considered where such policies are leading. (The Town and Country Act of 1946 marks a rare moment of wisdom in this regard.) Still less are they

<sup>32</sup> Meanwhile in London, the capital of one of the most capitalocentric countries of the world, planners have been reluctant to allow congestion on roads or tube lines to constrain demand or prompt businesses to see for themselves whether the time has come for them to expand elsewhere into places where economic activity is conspicuously lacking and housing cheaper and more plentiful. Such a policy has railway implications, to which let the response have proper regard for freight transport.

<sup>33</sup> See David Metz, 'The Myth of Travel Time Saving' *Transport Reviews*, 2007.

<sup>34</sup> I do not understand the arguments offered against recouping this expenditure by levying tolls on the motorway sections of the new network. Why should not such tolls reflect the engine capacities and CO<sub>2</sub> emissions of the vehicles paying the tolls?

considered in the light of problems of coordination which are inaccessible to individual choice.

Such questions are not new. For instance, the distinction has long been familiar between simple mobility and access to facilities, not least the access of those too old, too young or too poor to drive or without access to the car which goes away each day with a wage earner. The question became visible in HMG's 1976 consultation document *On Transport Policy*:

At the same time as mobility has been reduced for those without a car, [the] advantages [of car-mobility] have increased. For as car ownership spreads, schools become larger, hospitals are regionalized, out of town shopping centres multiply and the Council Offices are situated further away; meanwhile the local shop and post office disappeared [and local bus or railway services are diminished or, in some cases, never existed because whole neighbourhoods are themselves the creature of the pattern that Pettit has described for us.] Mobility becomes ever more necessary; but command over it for the minority grows less. This is perhaps the most important problem which emerges from our review of the Transport scene.

'Important' though this problem seems to have seemed to the government of that day, the same tendencies still continue almost unrestrained. Doctors are still encouraged (or almost compelled) to set up group practices. Hospital services are still amalgamated or sadly neglected in the expectation of imminent amalgamation. Thousands of post offices have closed. Policies for school education are still insensitive to such questions.

**16.** There is no way back to a universal way of life in which many an ordinary adult's everyday travel hardly exceeded eight miles a day and a huge generality of people found ways to locate their work and their dwelling-place (not to mention their doctor, dentist, shopping and recreation) along a good line of public transportation or at a walkable distance.<sup>35</sup> But there is every reason for public policies not to *aggravate* the problem we have made for ourselves (for it can still be

<sup>35</sup> It is worth adding that at the time we are recalling such lives were nevertheless not confined within that narrow horizon. Almost any place in the UK was within reach of almost any other place in the UK by public transport. Contrast a journey made at nearly 200 mph for two-thirds or four-fifths of the way only to find no more public transport at all for the rest of the journey.



aggravated enormously), not to acquiesce so readily or any further in the dispersed patterns of development that Pettit describes, and not to discourage a significant minority who might decide that that old way is the way they would positively like to live.<sup>36</sup> It is hard to resist the thought that it would not only reduce our carbon dependence but bring about something else that is desirable in itself if public policies were reoriented to take advantage of the diverse ways in which, even now, in a vast variety of places (not only the large city), human lives can still be lived without radical or near total dependence on the car. Too little thought has been given to the large public benefits of making ordinary life possible for a potentially numerous minority who might choose to live, or to continue to live, without dependence upon the car.

Another thought it is hard to resist is how little we should lose if we simply dropped all that talk about 'getting people out of cars or aeroplanes' and doing so by spending billions upon billions on high-speed railway lines. Cannot the new preoccupation with high speed as such be moderated by a much closer concern with the first and last stages of a journey. Suppose that instead some smallish fraction of the money and resources saved from these projects were spent on restoring rural railway connections to the main lines and reinstating railway stations which have been removed to make headways for very high speed traffics.<sup>37</sup> So far as getting people out of aeroplanes is concerned, moreover, there is no need for an expensive subsidy. Let HMG simply tax more heavily (but not without making first a careful carbon audit) those who suppose they absolutely have to make some rapid inland journey by aeroplane.

17. In what I have said, however breathlessly, about the particular examples I have chosen in order to illustrate the possibility of changes which might be desirable independently of climate change, you may perceive a drift, or a further drift, towards the centralized or managed economy (as if we did not already have one). For

<sup>36</sup> The suggestion is offered in full awareness of countless differences between town, suburb, exurb and country.

<sup>37</sup> See here more generally David Wiggins and Mayer Hillman, 'Railways, Settlement and Access', in Anthony Barnett and Roger Scruton eds, *Town and Country*, (Jonathan Cape, 1997).

It is noteworthy that in the same epoch in which rural public transport was dismantled hundreds of thousands of people were moving outwards towards rural areas. Witness the rise in house prices there and the lamentable effects for the rural economy of both these changes.

emergencies such as war or earthquake, flood or drought ... that is what you must hope for. But your must also hope that those who direct from the centre will begin to concentrate more un sentimentally on bare essentials, which will be numerous enough. For in truth top-down policy-initiatives are only one small fraction of the answer. Indeed, if top-down policies now multiply and take on the forms of regulation that we see all about us, then we are doomed.

Almost everyone whom one speaks to on this subject reports the waste of heat, light and capital they see all about them, reports the unintended energy consequences of every visit by Health and Safety (and the even larger consequences of the fear of such a visit) – just as they report how every ‘improvement’ they see in the office, school-room, club premises ... that they frequent has resulted in a net increase in the light or heat used or in air-conditioning. Until some idea or notion reaches every citizen about the nature and magnitude of the problem that confronts us all – until some new awareness comes to be expressed in all the ingenuity and enterprise they can bring to bear upon everyday life – we shall never know properly how much carbon we can save now *or* what energy we shall need in the future.<sup>38</sup> In the case of policy-makers, might not such an awareness, combining with a little common sense, fill the vacuum which has made politicians call for ‘joined-up thinking’ (at the centre)? In the case of town-planners, such an awareness might prompt them to think of the carbon cost of the building works and extensions they so often approve or even prescribe. In the case of architects, might not such an awareness prompt them to think of the carbon cost of the horrible material which they put down everywhere between London and Dubai and then beyond? I mean concrete. Five percent of human-originated carbon dioxide emissions result from freeing calcium carbonate previously kept safe within limestone and cooking the result to 800 centigrade.

These are simply examples. Is there any limit to the number of such observations which could be made? I doubt it. During the time when I was writing this paper, and within one square mile of central London abuzz with the sound of oil-driven machinery, I have witnessed road-sweeping machines deputizing (rather ineffectively in many situations) for brooms and human hands; helicopters idling endlessly back and forth over sporting events their hirers were promoting in a Royal Park; police helicopters hunting back and forth for one knows not what reason and police trucks lifting up private cars from expired parking spaces to take them to an official pound several

<sup>38</sup> See MacKay, 233, 178–9.

miles away in South London (do the police have to buy carbon credits?); the semi-pedestrianization (price tag £26 million) of 1000 yards of a London street by the laying of a quarter of a million tiles which are shaped either off-site or there on the spot by a petrol-driven cutting machine to make them fit into an abstract mosaic; a host of gardeners in two London squares either collecting leaves not with brushes or effectively but with motor-driven blowers or else mulching fallen branches with a petrol engine; the rearing over Hyde Park of yet another cliff in steel and concrete of luxury apartments far beyond the means of anyone poorer than a Russian oligarch; the huge and unprecedentedly destructive surface and sub-surface works of a £17 billion 'Cross-Rail' project which will perpetuate and enlarge the magnificent supremacy of the Greater London region over all other regions in Britain, but continue the processes which are depriving the capital itself of the low-cost neighbourhoods that Jane Jacobs so eloquently describes as essential to the creativity and small-scale enterprise of the city...<sup>39</sup>

Who shall keep track here of the distinction between essential and inessential or measure the distance these activities take human civilization towards the trillionth tonne of CO<sub>2</sub> emitted into the atmosphere?<sup>40</sup> Cap and trade? It does not even claim to be that sort of scheme. An agency or arm of the state implementing by yet further powers of selective prohibition an assemblage of abstract targets whose proper rationale will all too easily be lost to view? A parliament already possessed of the power to pass a law prohibiting almost anything, but scarcely equipped to forbid in precise legal terms that which is involved in the more wasteful of the activities here described? A far better instrument, better designed to keep a constant watch upon the world and to forestall many ill-considered projects, lies within human beings themselves. I mean their eyes and ears, their minds and their rational capacity, given only the right conditions, to exercise the licence to ask what the thing they are doing is *for*. I mean also their innate capacity to embrace and enter into an *ethos*, mentality or way of being which can be animated by the understanding of something seriously at issue.<sup>41</sup>

<sup>39</sup> See *The Death and Life of the Great American City*, 1962.

<sup>40</sup> For the symbolic and real significance of the trillionth tonne, see again Myles R. Allen *op. cit.*, note 3.

<sup>41</sup> Here too belongs a frame of mind, which in his forthcoming *Green Philosophy: Turning for Home*, (Grove Atlantic, 2011), Roger Scruton calls *oikophilia*, the love of home/homeland.

18. In 1939–40 when HMG was expecting the Blitz and a blackout was instituted in order to confuse the navigation of enemy bombers and fighters, it took only two or three weeks for everyone to catch on to the idea and to be ready to tap on their neighbour's door to tell them in friendly fashion if they were showing even a small chink of light. Citizens caught on effortlessly to the mentality that was expressed in posters put out by the government: 'Dig for victory', 'If you know something keep it under your hat'. What organized the thoughts and dispositions of citizens was the fear of destruction or invasion by a hostile power and an idea of liberty and human decency which they had resolved to uphold to the end. In the present what should organize our awareness and dispositions? A new awareness among the citizen body at large of the fragility and huge complexity of the life systems on which we depend and a concern for what remains of the beauty of the earth. But, in the place of 'Keep calm and carry on', I hope we may prefer some version of Hume's wonderful sentence,

All prospects of success in life or even of tolerable subsistence must fail where reasonable frugality is wanting.

*Postscript* March 2011.

As the typescript goes to the printer, one year after the lecture was delivered, the official estimate of danger from the nuclear accident caused by the earthquake in north eastern Japan has risen from level 4 to level 5 (out of 7). Apart from the danger of explosion or meltdown, drinking water and vegetable supplies are now radioactively contaminated in places as far south as Tokyo. This must be the moment to reconsider what I say in section 10 and think much harder too about the implications for the nuclear option of the political and ideological turbulence of a world constantly subject to war, civil war, terrorism and the fiat of dictators. I underestimated the strength of the case against nuclear energy. This mistake does not enhance the economics of the enormous on-shore and off-shore wind schemes currently projected. The case it enhances is for natural gas in the short term, for carbon-sequestered coal in the longer term, for solar in the longest term – and for the refusal to take as a simple given current demands for energy generation. Above all it helps the case (as I said) for a reasonable frugality.

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