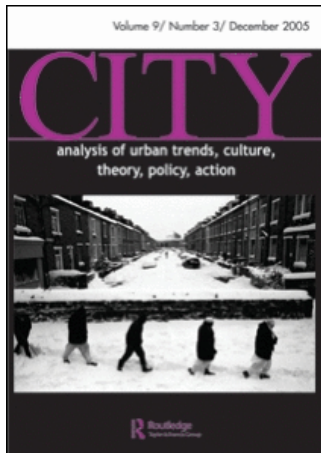


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Cities after oil—3

Collapse and the fate of cities

Adrian Atkinson

In this third and last instalment of 'Cities after Oil', I envision the stages through which 'modern' civilisation will collapse over the coming decades. The first essay analysed the discourse on sustainability and how this has abjectly failed to deflect what has become a fatal global development trajectory. The essay focused on the coming decline in available energy and the inability of our civilisation to function without vast and increasing energy supplies. The second essay looked at the general parameters of 'the collapse of civilisations' and then in detail at two key aspects of our civilisation that are driving it over the edge, namely, suburban living and the obsession with the automobile.

It is not at all clear how fast and through what stages the collapse will unfold because there are many variables which will interact differentially and depend crucially on political decisions taken—and possibly major conflicts—along the way; however, we can be sure that in general the decline will be inexorable. By the latter decades of this century, a radically altered world will have emerged, with a greatly reduced population living surrounded by the defunct debris of modernity, comprised of fragmented and largely self-reliant political entities. Our complex, 'globalised' world of megastates and technological hubris will be but a fading memory. The impacts of global warming and other environmental legacies of our age will reduce the options for reconstruction, possibly fatally. The essay ends by surveying the attempts in the shadows of our current civilisation to envisage and even live 'alternatives' that might be seeds of the reconstruction of a civilisation viable within the resource and environmental constraints that can be expected to prevail.

Prologue

Having spent much time in recent years studying the past and future of energy and its meaning and impact on culture, society and economy, the current atmosphere can only be described as eerie. Life goes on as if we had never had it so good and things can only get better. The roads and airways are fuller than ever with shinier cars and larger aeroplanes going ever further and to more places. The supermarkets and department stores are overflowing with goods and ever more sophisticated shops appear in high

streets and malls ... *Fortune* magazine, the most ebullient mouthpiece of US capitalism, illustrates well the mentality at the forefront of this condition, giving us a sense of the contradiction between surface appearance and emergent new reality. The incipient descent into economic recession of the USA appears regularly in such headlines as: 'Market Shock 2007 (Now What?)'¹ and 'Recession Chatter gets Louder'.² And in parallel commentary is provided on inexorably rising energy prices.³ However, the apparent presumption remains that the problems are temporary with comments

such as that voiced by US Treasury Secretary Henry Poulson that ‘global economic fundamentals remain healthy’ and headings like ‘How High can Oil Go?’⁴ followed by discussion of detailed reasons as to why we are witnessing recession and high energy prices. These include everything except the fact that the production of oil is in the process of peaking and thence on its way increasingly precipitately to a terminal decline that will, over a few decades, totally destroy the world in which the readers of *Fortune*—and with it the whole consumer society—live ...

Introduction

This is the third and final essay in a series that has unfolded in the pages of *CITY* over the past few months. In the first essay (Atkinson, 2007a), I looked critically at two aspects of the recent discourse on ‘sustainable development’. Firstly, in recent years this has generated a vast literature and apparent political attention which has, however, failed signally to steer our society into a sustainable path, crassly contradicted as it is with an insistence on endless economic growth. This essay noted the increasingly fragmented way in which the issue has been addressed. It concluded that in an increasingly ‘globally integrated world’ sustainability cannot be meaningfully looked at in terms of fragments, on the basis of single indicators nor in an isolated way at the local level. Today even the most self-reliant societies are vitally dependent on the flow of resources from right across the globe that escape local and even national analyses of sustainable development. Perspective has been altogether lost on what is genuinely a sustainability problem and what is not.

Secondly, and directly related to this, the future availability of energy supply is never assessed as a dimension of efforts to achieve sustainable development. Concern extends only as far as the aspiration to reduce

energy needs (energy efficiency and conservation) and increase energy supply from renewable sources. In the event, the major source of energy throughout the ‘developed’ world today—and indeed increasingly also the South—is from fossil fuels which everyone knows will one day be exhausted and so cannot, logically, be seen as sustainable. The hope is, of course, that before these are exhausted, other sources will become available to continue the upward path of energy supply. So proposals aimed at achieving ‘sustainable development’ rely everywhere overwhelmingly on insubstantial hope, rather than any very realistic analysis.

The second part of the essay thus looked in some detail at future energy demand and supply dynamics and concluded that although it may be many decades before fossil fuels become truly scarce, in fact their availability will start to decline at a point where only half the accessible resources have been exploited. This point is, actually, imminent and we can expect the price of these fuels to be rising rapidly in the next decade or two with probable dire economic repercussions given that alternatives cannot reasonably be expected to be developed fast enough to make up for the shortfall. Furthermore, awareness has been rapidly rising that the use of fossil fuels on the present scale is almost certain to have disastrous consequences in changing the earth’s climate. However, no-one with any official status in the matter is prepared to suggest that we stop using fossil fuels long before the point of exhaustion.

The second essay (Atkinson, 2007b) looked in detail at why our society, so extremely dependent on vast throughputs of energy, is allowing itself to slide into a situation where this will no longer be available, without adequate focus on this fact and consequently with totally inadequate concern for the consequences. Again the analysis is in two parts. Firstly, I looked in general at how and why societies—and

complete civilisations—have allowed themselves to collapse in the past.⁵ In focusing on our civilisation I looked in particularly at the millenarian ‘core value’, namely, an open-ended drive for ‘growth’ and ‘development’ grounded in a deep-seated belief that this is fundamentally good and even inevitable. Today, this has decanted itself into a post-modern consumerist society, voraciously consuming with a pitifully inadequate regard for the consequences. The second part of the essay thus analyses the hegemonic suburban lifestyle and specifically the obsession with cars that lie at the centre of our ‘consumer society’ and which increasingly appear to be the nemesis of our civilisation.

The overall conclusion is that our civilisation is poised to collapse. This essay now takes this up and attempts to envision the steps through which this collapse is most likely to unfold in the decades ahead. First it looks at how the available information on the coming decline in energy is being systematically obscured in the political process (we might say with the tacit collusion of the people). It is rather apparent that few meaningful measures will be taken to mitigate the collapse; on the contrary actions so far can be seen as actually exacerbating matters and thus making more catastrophic the final dénouement.

The first half of the analysis looks at the general, we might say global, scenario, taking a more or less chronological view: what is happening now and likely to happen in the next 10 or 15 years within which the downturn is likely to begin—although steps might be taken that will delay the downturn for up to three decades. This is followed by an assessment of the steps we can expect to unfold in the years following this, ending in a return more or less to the kind of energy-parsimonious world that existed before the event of fossil fuels. The second part of the analysis looks at changes that will take place in this context to settlement patterns. ‘The end of suburbia’ is already being widely

discussed in the USA that is likely to end in a return to the land and small communities, abandoning most of our current urban settlements as being uninhabitable without the availability of current levels of energy throughput. Separate subsections focus respectively on cities in the South, cities in Europe and cities in the USA. In the conclusion I discuss recent discourses and experiments in ‘alternative’ arrangements to our present-day society. Few of these, however, recognise that workable alternatives will have to be relevant for much simpler societies than we have today and that the discourse needs to re-orient itself to address conditions we can expect to experience, post-collapse.

Declining energy: the general scenario

What is so far acknowledged

Over the past five or so years there has been a rapidly growing literature in the USA focusing on the consequences of ‘peak oil’. This is the point at which global oil output reaches its maximum, after which production goes into terminal decline. Whilst, for a time, substitutes will be available, a progressive rise in petrol and in general energy prices is nevertheless expected as a consequence.⁶ So far a European literature is just beginning to emerge, recognising that ‘peak oil’ is upon us; no articulated attention at all has so far been paid to the subject elsewhere in the world. Hence the development of realistic remedies or the possible consequences on economies and lifestyle is as yet almost entirely unexplored.

Of vital importance to managing the energy-descent to avoid chaotic economic collapse will be the issue of whether, and if so when, effective organisational and institutional structures will come into being to plan a realistic, low-energy future. One would love to think that the world will all of a sudden come to its senses and focus attention on planning a set of measured steps to an

energy-parsimonious society. However, the likelihood of this happening is now vanishingly small and this essay assumes that this will not happen (hence the tendency below in discussing ‘collapse’ to use the term ‘will’ rather than ‘may’).

Books starting to focus on the ‘emerging energy crisis’ both by ‘conventional’ economic and political commentators⁷ and more independent observers are currently proliferating. In the first case these are attempting to defend a reduced version of current ‘modern’ lifestyles implying continued mass car ownership and use, as well as the complex global system of production and distribution (e.g. Weizsäcker *et al.*, 1998; Rifkin, 2002). This is of course implying a certain curtailment of the neo-liberal notion that the invisible hand of ‘the market’—that is, the sum of independent, uncoordinated economic actors (producers and consumers)—will solve the problems of life with diminished energy. And this in turn presupposes the curtailment of the post-modern haze in which the population at large in the northern countries continues to assume it can indulge itself in its car-based suburban and consumerist lifestyle in an unfettered way.⁸

This has political and institutional dimensions: there has to be an agreement on the part of elites but beyond that by whole populations supporting them that planning and strong regulation is necessary both in principle and the particular way it is implemented—and it is certain, as discussed in more detail below, that the current US—or indeed any—government is very far from accepting this.⁹ Then there have to be tough decisions as to how such planning will be organised. The precedents are: the *de facto* organisation of European economies in the context of the First World War and immediately thereafter the invention of state planning in the first years of the Soviet Union that were consolidated in the process of organising the Second World War and thence more or less continued in the framework of social democracy until

the neo-liberal ‘counter-revolution’ of 1979–80 and in the case of communism until the collapse of the Soviet ‘empire’ in 1990–91. Antipathy to planning of this kind is, however, deeply embedded in the US social psyche which makes it unlikely that anything effective will emerge even well into the collapse. In Europe, this might emerge ...

Many writers are speculating that the reaction of the US government will be to extend its access to global oil reserves through military action with Iran clearly in the line of fire.¹⁰ The US administration has been given clear indications of the energy problems ahead¹¹ but has actually argued against energy conservation (seen as lowering of American living standards) choosing rather to urge measures to take greater control over remaining oil resources (Heinberg, 2004, pp. 63–67). Strahan (2007) argues from detailed documentary evidence that the invasion of Iraq was in great measure a question of asserting US interests in oil. However, interpreting this as the first of such interventions, it becomes clear that this has been something less than a great success in facilitating the flow of Iraqi oil. Destabilising Iraq has led to restriction, through terrorist action, of oil exports whilst increasing the economic and energy burden of the US government.

Further such actions—which cannot be ruled out in a situation where US political rationality, interested primarily in a combination of personal profit and ‘political theatre’ rather than the longer-term welfare of the American people, appears to be distancing itself radically from policies necessary to confront the energy future realistically—are likely to accelerate the country down the road to a chaotic energy supply, and with it, economic collapse. The invasion of Iran would certainly result immediately in sabotage of the kind we have been seeing in Iraq and hence a sharp decline in global oil availability—Iran being the world’s fourth largest producer—with concomitant sharp rises in price.

I was waiting with bated breath for the International Energy Agency's (2007) *World Energy Outlook 2007* to appear in mid-November 2007, wondering if at last there would be recognition of the unachievability of the global energy demand aspirations expressed in previous years' energy scenarios. But no! On the contrary, with a new major focus on the breakneck growth in energy use of China and India, the energy demand figures to the year 2030 of the 2007 *WEO* are even higher than previously—with an assumption that somehow the resources will be forthcoming. In July 2007 the Agency was predicting that oil supply will no longer meet global demand in 5 years from now and that gas markets will be tight by 2010.¹⁶ So how is it that the bottleneck will be overcome after this? Almost all serious analysis points to a peak in oil production within at the latest one decade from now—and many speak of this occurring imminently. It is difficult to avoid the view that the *WEO*'s assumption that global oil and gas supply will continue to increase at least until 2030 is moving into the realms of the surreal. Perhaps the following statement in the Foreword to the *WEO 2007* hints at their logic:

'There can be no moral grounds for expecting China and India selectively to curb their economic growth¹⁷ simply because world energy demand is rising unacceptably, with associated risks of supply interruptions, high prices and damage to the environment.'

It is not a question of complete absence of the resources—still less than half the expected extractable oil and gas resources have been exploited—but that the rate of supply will from here on be reducing inexorably (some believe precipitately), a fact simply ignored in the *WEO 2007*. It seems that the IEA cannot bring themselves to face facts and to state how things are. Which reflects a world that has reached a frenzied level of energy demand that constantly builds itself into the structures of life such that without increasing supply, less and less can function at all ...

Box 1

It is certain that the US and indeed international policy stance is still entirely oriented towards maintenance of the current upward trajectory of energy demand. The case of the International Energy Agency's (IEA) *World Energy Outlook (WEO)* for 2006 was discussed in the first essay in this trilogy (Atkinson, 2007a, Box 1).¹² It must be noted that some policies are in place in EC countries and even the USA (in spite of the antipathy of the administration) to promote renewable energy sources such as wind power¹³ and biofuels.¹⁴ However, although these sources are increasing, the IEA having carried out exhaustive analyses of possibilities in the next two decades (IEA, 2002),¹⁵ we cannot in any way reasonably expect these to be capable of filling more than a small proportion of the growing gap between energy demand (aspiration) and energy supply that will appear in the near future and—on the assumption that it will actually

be available—fossil fuels will still be supplying between 70 and 85 per cent of our energy.

The USA, Canada and Venezuela possess very large reserves of so-called 'unconventional' oil reserves, locked in rock and sand deposits that can be mined and thence the oil extracted, rather than yielding oil directly. Only massive investment in these resources (known as shale oil and tar sands) and oil and gas processed from coal (known as liquefaction and gasification) could be relied on to extend the current trajectory for several decades (Hirsch *et al.*, 2005). The 1973 oil crisis triggered a US policy to develop improved coal liquefaction technology with the intention of supporting a major construction programme. This was revised by Presidents Ford and particularly Carter who indeed possessed a broad vision of the need for the USA to start investing for the post-oil future. His concern with non-oil energy policy is generally seen as a significant contributor to his failure to be

ected for a second term and the drop in oil prices in the mid-1980s resulted in termination of support for the programme (Johnson *et al.*, 2004, p. 43). So far there has been little by way of revival of policies to promote coal or unconventional sources of oil, though the private sector is seeing it in its interests to make some investments in this direction, as indicated by the increase in coal-fired power stations in the USA and increased mining activity of the Canadian tar sands¹⁸ and US oil shale (Birger, 2007).

Notwithstanding current technological bottlenecks¹⁹ and constraints on the speed at which these resources can be accessed, it is likely that massive investments in these will, in fact, be initiated. Global coal resources are concentrated predominantly in three countries, the USA, Russia and China and it is likely that all three countries will in the near future be investing heavily in coal liquefaction and gasification plants—this is already a component of Chinese energy policy (Nolan *et al.*, 2004; IEA, 2007, Part 2). We can also expect increasing investment in the USA and Canada—where are located by far the largest reserves—in mining of oil shale and tar sands. It would certainly be better were this not to happen in so far as the environmental consequences will be dire (very high greenhouse gas emissions per unit of useful energy due to high energy expenditures in extracting the oil, huge amounts of polluted waste water and then vast areas of land laid waste) and the height from which the eventual energy collapse will fall will be vastly greater.

The pressures will be there to proceed and the real concern with the possible consequences of rapid increase in greenhouse gasses currently remains well short of questioning seriously movement down this path, as illustrated by the clearly inadequate response of the IEA to greenhouse gas production even in the face of apparent G8 concern and the Bali conference of December 2007. Either before or after this, the energy decline will set in: in the first instance earlier and with more flexibility to react in a coherent way; in the second instance, the descent will be more precipitous

and over a greater distance with very little flexibility to design any kind of plateau or end condition. We can therefore estimate that the energy decline could start anywhere between within the next 10 years and the middle of the century.

On the edge of the precipice

Whilst, as noted, the US administration has not openly acknowledged the difficulties ahead, the US Department of Energy has, however, produced a revealing report that opens up a certain vista of what we might expect (Hirsch *et al.*, 2005).²⁰ This report entitled *Peaking of World Oil Production: Impacts, Mitigation and Risk Management* states forthrightly that the problems arising from peak oil will not be temporary, requiring aggressive government intervention to manage as the social and economic implications (i.e. a general decline of the economy) will otherwise be chaotic. Mitigation measures—including major investment in unconventional sources of oil—will need to start at least 20 years before peak oil which was, at the time the report was written, expected some time between 2010 and 2020.²¹ The report introduction ends on the following note (Hirsch *et al.*, 2005, p. 7):

‘In summary, the problem of the peaking of world conventional oil production is unlike any yet faced by modern industrial society. The challenges and uncertainties need to be much better understood. Technologies exist to mitigate the problem. Timely, aggressive risk management will be essential.’

Already steadily rising prices since 2000 have brought the reality of peak oil into the consciousness of a growing public and the reaction in the USA has been to economise on energy—resulting in a rapid reorientation of car purchase towards more energy-parsimonious cars, precipitating crisis amongst the US manufacturers and joy amongst their Japanese rivals²² and thus immediately leading to dampened energy demand,

briefly bringing the price of oil back down. This seems to be the start of a repeat of 1973 and 1979 and is probably the first of a series of increasingly violent fluctuations in the price of oil and with it other energy sources.

There are very substantial energy savings that can be made by individuals, companies and institutions without any significant change in outcomes (smaller cars and driving less, insulating houses, more energy-parsimonious production processes, etc.). We might expect to see these economies coming into effect step-wise in the next one or two decades as energy prices rise, then fall again in response to less energy purchase. The first dramatic event likely to take place is the collapse of the international tourist industry. This is currently the largest single industry globally with many millions of people immediately dependent on it for a living and with secondary effects extending deep into many economies of Europe and many countries of the South. It is also well known that holidays in distant places are the first saving that the 'middle classes' make when their economic situation deteriorates, which is the way in which rapidly rising energy prices will manifest themselves to the average citizen. The collapse of the international tourist industry may start by seeming like a recession but ending in almost total evaporation over a short time period—with the airlines and the civil aircraft production industry following rapidly in its wake.

The car industry and everything associated with it will also go through convulsions. People will use cars less and buy smaller cars. Depending on the rapidity of the impoverishment, the demand for cars will drop precipitately with the corporate giants that organise the car production process and the production chains which they support either collapsing dramatically²³ or rapidly restructured to produce fewer vehicles and vehicles that respond to the new conditions. As the general collapse deepens we can expect the vehicle industry to fragment, with relatively local production where this can still be sustained. This will, indeed, be the case in

time right across the spectrum of manufacturing industries.

Economic oscillations could be extended according to the effort put into investing in coal and unconventional energy sources and, to a lesser extent, in nuclear power and renewable sources of energy. Then, assuming that there has not at the same time been a sea change in political attitudes, introducing effective comprehensive planning for reduced energy, the descent is likely to happen quite suddenly where the scope for saving in profligacy comes to an end and lack of energy begins to disrupt lifestyles and with them the global production and distribution system.

In fact there is a possibility that the sudden descent will come well before much has been done to extract oil from unconventional sources or even proceed far into the cycle of energy reduction. The IEA notes—albeit in measured tones—the increasing vulnerability of the international energy economy to disruptions. These could be environmental (hurricane Katrina knocked out a significant amount of oil supply from the Gulf of Mexico with immediate effect on oil prices) or political including attacks on major oil installations or restriction of supply by one or more of the increasingly narrow group of major suppliers. Strahan (2007, ch.8) argues convincingly that a significant rise in oil price—or indeed an economic shock from quite other directions—is very likely to accelerate what is already an incipient downward trend of the American economy.

It is well-enough known that the US economy is in a parlous state due to vastly overextended public and private debt with the collapse of the mortgage industry across 2007 possibly being the prelude to a more general descent.²⁴ In practice the US economy is held up to an extreme extent by the fact that the global economy—including trade in petroleum—is financed in dollars which are recycled back into the American economy, allowing the continued extension of borrowing. Any significant transfer to the euro for instance—not an impossible event—or, in general escalating speculation against the

dollar (already in steady decline in value) as has happened to other currencies in recent years, is highly likely to start a downward spiral of US economic activity that would not only have dire repercussions for the US population as the prices of imported products including energy rise, thence proliferating bankruptcies, widening home loan defaults, etc. but react back on the global economy as dominating US demand for imported products declines.

Such a downward economic spiral will almost certainly some way into it bring about a sudden diminishing of energy supply. As energy prices rise there will be contradictory tendencies whereby money will flow towards profitable investments but where the resources necessary to continue to access new sources and even to continue accessing resources already in production but under difficult conditions are likely to be curtailed and almost immediately the supply lines will wither so as to more or less suddenly reduce energy supplies everywhere. That is to say that the marginal cost of accessing what is left of the resources which in any case are increasingly costly to access (in difficult territory, under water, etc) will suddenly escalate, demanding an inordinately high proportion of available capital (and indeed energy as, by now, the rather obvious fact that energy is the foundation upon which capital ultimately rests should have become evident). Even much of the renewable energy supply can be expected to be reduced (particularly the national wind energy systems) due to the failure of the fossil fuel-dependent infrastructure necessary to produce and maintain supplies from these sources.

Thus energy supplies will not only escalate in price but at the same time plunge in availability. Competition for energy will escalate between accessing more energy to supply the basic needs of global society and maintaining 'modern' lifestyles including not only northern car-based life but also urban life in all parts of the world. It seems inevitable that global food supply will diminish precipitately. The demand for agrochemicals upon

which the global food chain is now so heavily dependent will not be met.²⁵ Developments in organic farming have made great strides in recent years (Rigby and Brown, 2007) but this has been selective in terms of produce (being a European movement, focusing mainly on produce in temperate climates); without such developments, organic crop yields per hectare are substantially below the levels obtained using agrochemicals.

Currently much of the world's food is produced from plant strains that require substantial inputs of agrochemicals (one thinks particularly of rice upon which vast populations not only in Asia but also Africa and Latin America are dependent) which grow with difficulty and are very susceptible to disease without these chemical inputs. Genetically modified corn has been developed in close association with the need for substantial chemical inputs. Farming will become 'organic by neglect' meaning that soils everywhere will become over-exploited and thus further diminish in productivity (Pimentel and Giampietro, 1994, p. 15, cited in Kates, 2004b, p. 61). In addition, the impacts of global warming on ecological systems in reducing the productivity of food crops and eventually radically degrading entire ecosystems will add to the decline in available food (Monbiot, 2007).

Thus in so far as the descent into global energy-poverty is rapid and the impacts of rising global temperatures on ecosystems manifest themselves, so food productivity will collapse with rather obvious consequences in terms of support for current global population levels. Famines kill but also weaken the survivors who become vulnerable to disease and, if the vulnerable population are many and at close quarters, this is fertile ground for pandemics in a situation, we can imagine, where the health care infrastructure is also liable to be weakened by lack of resources. It has, further, been pointed out that global warming will greatly increase the vulnerability of populations to disease (Warren, 2006) which will add to the magnitude of the catastrophe.

As an aside it should be noted that there has, of course, been an ongoing worry over the past decades that the global population has already ‘overshot’ the carrying capacity of the ecosphere with numbers-games being bandied about regarding what can be borne by the earth in the long term. Strangely, this has never been discussed specifically related to the amount of energy that will be available to future generations. Rather this has been couched in terms of a general theory of an emerging ‘demographic transition’ where growing affluence as a consequence of development is seen as being associated with families having fewer children. Thus the UN has adopted a graph that sees global population levelling off at around 10 billion by the end of this century that simply assumes that current development processes will continue into the distant future (overlooking the reality that vast populations of the global poor are not benefiting from ‘development’ even today).

The critique, most commonly seen in terms of the *Limits to Growth* scenarios (Meadows *et al.*, 1974) but with a wide range of established scientific opinion in general agreement,²⁶ has seen this as not being possible because of the pressures that the consumption patterns of this population exert on the biosphere that would eventually precipitate ecological collapse, bringing the human population down with it. This debate, that until the Cairo population conference of 1994 was quite visible and audible, thereafter became marginalised in the light of a tacit agreement right across the political spectrum from religious conservatives through liberal human rights advocates to feminist ‘body politics’ that population control is ‘unnatural’ and coercive and hence unacceptable.²⁷ On the theoretical side these debates often end up contemplating the famous—not to say contentious—theory of Garrett Hardin’s *Tragedy of the Commons*²⁸ that is tantamount to a modern reformulation of Malthus’ population theory that is fatalistic about the inevitability of overpopulation. What we see ahead of us is the emerging dénouement of forced

population reduction around the specific problematic of energy-starvation, accompanied by other environmental problems that will make life difficult for the survivors.

Gas and electricity grids will fail initially sporadically (a phenomenon already evident, particularly in some southern countries) and then breaking down permanently into local grids covering progressively less and less territory, less and less reliably²⁹ so that light, heating, refrigeration—an apparent small thing, yet so vital to the health of our food supply system—even fuel for cooking, will become problematic. Electronic communications will be disrupted and electronic control systems, that have become so essential to the functioning of so much in our society, will fail rendering global and local supply systems incoherent such that delivery of even basics to modern sector populations (urban and suburban across the globe) become susceptible to falling apart. Electricity will thus become a local luxury where the machinery can still be maintained through the availability of relevant skills, manufacturing capacities, materials and primary energy sources, and otherwise fail altogether.

Most of what today is considered to be ‘information’ will disappear—for three reasons. Firstly, much information today is only available electronically and with the failure of electrical systems this will disappear through the illegibility of electronic memories. Secondly, most of what is deemed to be useful today by way of knowledge and information will lose its relevance and so be abandoned. And finally, making a living through developing and processing knowledge will become a luxury in so far as most human time will return to manual work in fields and workshops. One can imagine, if there is some planning for an energy- (and knowledge-) parsimonious future, that some centres (universities or whatever) will survive and these will rescue and store information and go on to recover or re-learn knowledge relevant to the emergent circumstances.

There is a faint chance that some way down the slope there will be some kind of

plateau in which at least certain regions recover a semblance of early modernity (turn of 20th century?) based on coal (Goodell, 2006). There are very substantial resources of coal in certain parts of the world and with the introduction of some kind of planning aimed at economic reconstruction, rebuilding agriculture, industries and settlements and associated communication systems that can work with modest energy requirements, one can envisage a semblance of modernity, with simplified technologies and modest lifestyle ambitions, relative to today. It is, however, from our present standpoint extremely difficult to envisage in terms of social and political outlook and organisation. Given the knowledge that there will be by then of the catastrophic long-run climatic effects of continuing to use fossil fuel (and particularly coal), and that coal supply, too, would have a relatively short life, the plateau would be known from the outset to be a temporary state.

Life after fossil fuels

We can be almost certain that the political and ideological hold that the USA has on the world today will collapse quite soon into the onset of energy decline. The collapse of the US way of life—the American Dream—and its more modest variants elsewhere will have the effect of disorienting a major part of the elite and modern ‘middle class’ of the rest of the world—perhaps less in Europe but particularly in the countries of the South with Latin America at the extreme. Indigenous cultural attitudes can be expected to resurface and hence ‘global culture’ will evaporate and reveal inward-looking orientations that will look to past culture but in many cases find relatively little of substance that has survived. This is highly likely to degenerate into local hand-to-hand conflicts around the assertion of racial, ethnic, religious and other ideological differences ranging from the systematic, such as in Rwanda, to the complex such as the Lebanese civil war where everywhere, but

particularly in cities throughout the world, different groups and orientations are now clustered densely together.

Life and beliefs will thus be subject to profuse invention with ‘modern’ lifestyle aspirations lingering on but no longer achievable. It is obviously impossible at this point to predict whether any national governments will become outwardly belligerent and seek resources to make war with neighbours (the most obvious problem area being the Middle East). It would seem *prima facie*, even if internal tensions should incipiently attempt in such a way to externalise the problem—assuming national governments can continue to remain coherent—that the resources will simply not be there to exercise such aspirations for any length of time and these will only accelerate the collapse.

The individualistic orientation and outlook of occidental culture that has reached extremes in today’s younger generation will stand us in very poor stead to survive the emergent conditions. American survivalism of course makes no sense at all as the kind of saving of the accoutrements of modern life will help at most for months and the idea of individual self-defence will mean people starve all on their own. Hobbes’ ‘war of all against all’ will be the truth for those who cannot—to use Jared Diamond’s (2005) phrase—‘change their core values’. New attitudes of cooperation and thence a fundamental change in self-understanding of the human condition, abandoning today’s liberal individualism, will characterise those who will be able to survive by rebuilding dense effectively functioning social relations.

The rapid deepening of the impact of modernity (occidental culture) across the South over the past several decades has certainly wrought severe damage upon pre-existing communitarian attitudes and structures. However, members of the older generation will survive with a recollection of these and in some places—particularly in Africa and parts of Asia and even amongst indigenous groups in Latin America—these may be revivable as part of a foundation for

reconstruction of coherent and viable lifestyles. A notable contrast between the Occident and all other parts of the world is the persistence elsewhere of strong (often patronage and familial) social ties that could be construed as structures that will help to soften the collapse beyond the borders of the Occident. The individualist bent of Occidental culture (less evident even in Southern Europe) and the growth of contractual relations and with it the loss of affective social relations (namely, the current discourse on 'social capital') may be seen both as an important foundation for the growth of the forms of complexity of the modern world but at the same time highly problematic when looking into the future collapse.

Any up-welling of fundamentalist Christianity and many other religious manifestations in the world today, however, already severely dysfunctional in the modern world, will show themselves to be even more dysfunctional and everywhere it will be necessary to develop new moral and ethical outlooks as a basis for mutual survival in the context of the emergent conditions. The Occidental belief in progress, discussed in the second essay of this trilogy, will fade away and the collapse will only find a floor where attitudes orient themselves to ideas of long-term, stable and sustainable organisation of social relations and relations with relatively local environments.

For the Occidental mind, this will prove difficult—and one might add for the American mind almost impossible—albeit 'intentional communities' with their experiments in 'alternative living', in participatory planning and 'environmental values and ethics' might be conjectured to be the start of what will necessarily become the mode of belief and action of societies reconstructed at the base of the collapse precipice (Sargisson, 2004; Fellowship for Intentional Community, 2007).³⁰ The rapidity, coherence and depth to which these new attitudes emerge will be the basic determinant of where on the scale between modernity and 'primitive' society particular groups (localities, regions, maybe even nations) come

to rest. That is to say that we can conjecture a relatively complex society of ancient China or India as a viable, sustainable, future cultural configuration with sophisticated arts and products and the necessary complexity of administration to support this. But without an effective system of belief that has a powerful social dimension and an ethic that acknowledges the need to maintain local environmental resources, the descent may be expected to continue right down to extinction.

We can be sure that the cultural disorientation will in the first instance be extreme. Recent findings on the catastrophic impact which the European intervention had on pre-Columbian American societies are perhaps the nearest we can come to seeing what might happen (Mann, 2005). It is now thought by some that over the century following the arrival of the Europeans, the population of the Americas was reduced, through wave after wave of pandemics and accompanying destruction of social and political systems, by as much as 90 per cent. This gives us some insight of how a truly massive collapse can proceed and the results of this in terms of disorientation and degeneration of social systems.

To end this section I wish to return to the issue of matters that today are discussed in terms of environmental sustainability. The bottoming out of the collapse could be seen in the first instance as a question of returning everywhere to a situation where energy resources come from the sun, the wind and the biosphere. We can speculate on the relative sophistication of the technologies that will be applied but, as noted, it is unlikely that much will survive of today's hi-tech means of capturing renewable energy due to the demise of the support structures that include mining and processing of materials, and the fact that technical knowledge and manufacture that today is very concentrated will become fatally diluted by dispersion due to the collapse of transport and communications.

Without introducing new variables we might conclude that the collapse is likely to have contradictory effects on ecosystems. On

the one hand soil degradation and loss of habitats due to the constant spread of chemical-intensive farming in recent years will cease and in this direction we might expect a reversal of the progressive loss of biodiversity we have been seeing. On the other hand, new forms of farming intensity due to overcrowding of impoverished subsistence farming noted above might change the nature of the stress on ecosystems but not the processes of degradation. My own guess is that population reduction will be so great in most parts of the world that agricultural stress on the land (and the falling into disuse of the infrastructure of cities and other detritus of modernity) will in principle make space for ecosystems recovery and re-growth albeit over a longer time span.

But then there is a further dimension that must be taken into account and that is the unfolding of environmentally destructive processes that are already in train and that will not immediately end with the disruption of the processes of modernity. The most obvious of these is global warming which has indeed reached the top of the political agenda and is currently very widely discussed.³¹ It would seem to be supremely ironic that the earlier the collapse happens and use of fossil fuels is curtailed, the less damage will occur due to global warming. Three-quarters of the forcing effect of global warming is due to the use of fossil fuels—originating both from carbon dioxide consequent on the burning of fossil fuels and the escape of methane consequent on the exploitation and use thereof.

Policies being discussed to reduce this effect include proposals—of questionable realism—for ‘carbon dioxide capture and storage’ (CCS) (MIT Coal Study Group, 2007; Metz *et al.*, n.d.) and a wide range of proposals to reduce energy use, but nowhere any direct reference to an eventual crash programme to eliminate the use of fossil fuels. As noted in the first essay in this trilogy³² and confirmed in the *World Energy Outlook 2007*, the International Energy Agency expects—even in their Alternative

Policy Scenario—a rapid increase in the output of carbon dioxide at least until 2030.³³ Sea level rise due to global warming, already discernable, is expected to accelerate in the coming years and ultimately, should all the Greenland and Antarctic ice caps melt, the seas will rise by almost 70 metres,³⁴ inundating land which today houses and provides resources for well over half the world’s population. The Intergovernmental Panel on Climate Change (IPCC, 2007) that is responsible for providing authoritative information on climate change issues expects this to take several hundred years but it could take place in steps as was the case after the end of the last ice age 20,000 years ago following which the seas rose by 140 metres. The first such step could be a sudden collapse of the Greenland ice shelf that seems currently to be building up, raising the seas by up to 7 metres.

Furthermore, each degree of temperature rise has ever more destructive effects on the earth’s ecosystems (Warren, 2006; Monbiot, 2007). The IPCC has estimated that across this century the earth’s average temperature could rise by between 1.8 and 4.0°C. If, as is being actively considered by scientists as possible, this should release the massive stores of methane hydrate currently locked in the arctic tundra and on the ocean seabed—this being a far more potent greenhouse gas than carbon dioxide resulting from fossil fuel use—then without further human intervention the greenhouse effect will be progressively intensified. Indeed, such a temperature rise seems to have happened some 250 million years ago, as a consequence of volcanic activity releasing massive volumes of CO₂, almost extinguishing the earth’s ecosystems (Benton, 2003) and this time the process might succeed completely in reducing the earth to a lifeless ball of rock like our neighbouring planets. The extinction also of mankind would clearly result somewhere along this line. This is in no way an apocalyptic prophesy but rather the balanced assessment of a wide body of scientific research and opinion.³⁵ However, this possibility is

not further discussed or assessed in this essay although obviously weighing heavily in the mind as presenting at best constrained options—or no options at all—for rebuilding civilisation after the collapse.

The impact on human settlements of the decline in energy

So far public debate about the consequences of diminishing energy has been almost entirely confined to the USA and concerned with the emergent unviability of American suburbia in the face of steeply rising energy prices.³⁶ In fact the phenomenon of ‘spread city’—or ‘urban sprawl’—has been proliferating around the world and in this way the European version of suburbia and extensive peri-urban developments even in urban regions in southern countries are also vulnerable to any substantial rise in fuel prices. The reactions, however, are likely to be very different in different parts of the world. In the following paragraphs I speculate on the way in which the collapse might impact settlement patterns in different parts of the world.

Settlement patterns in the South

Perhaps the best way to understand the urbanisation processes that have been taking place in the South in recent years is as follows: this has not really been a general decanting of rural population to urban areas but that towns and cities are absorbing and concentrating excess population that can no longer be supported by rural economies or that is displaced by production for global markets (to satisfy the proclivities of the North). This can continue so long as fossil fuels increase food and basic livelihood productivity and the urban (informal) economies redistribute enough resources to meet the survival needs of this population. In much of the South, urbanisation and the drift to urban regions has happened to the major-

ity of these populations within this generation or at most the last.

So we can expect, with the decline in energy resources precipitating urban economic crisis, that much of this population will simply attempt to return home and to return to farming and vernacular modes of manufacturing. This phenomenon has precedents in various places in the course of the 20th century, notably in Germany and Japan following the destruction of their cities in the final months of the Second World War and also in some eastern European countries (including Russia and Romania) following the collapse of communism. We saw this in a small way in Indonesia in 1997–98 as a consequence then of the collapse of the currency, the rendering jobless of tens of thousands of formal sector workers and thence hundreds of thousands of informal service workers who supply there needs, encouraging them to return to their villages. As the energy nexus tightens, we can expect these kinds of urban–rural migrations on a massive scale.

The problem here will, however, be the already almost universal over-population of rural areas, relative to the resource base, such that there will be no work and nor, with declining food production as a consequence of diminishing use of agrochemicals and climatic change, enough food for all. There will simply be nowhere for what will now become evident as excess population to go. Life for those who remain in the urban slums will also take an increasing turn for the worse: already on the margins, if the price of the basics of life and particularly food should rise significantly, then we can only expect spreading famine and epidemic disease in many of what are now referred to as ‘megacities’ rising to a crescendo with the progressive diminishing of resource and with the cities themselves progressively thinning out in terms of population (Atkinson, 1993). Many of these are in coastal areas which will also be affected by rising sea levels and hence will be subject to increasingly serious flooding and thence permanent inundation of substantial areas of the cities.

We might thus speculate that in general there will be a reversal of the urbanisation processes that have been taking place over the past half century in the South. However, extensive landscapes will continue to be occupied by the debris of modernity with peri-urban areas reverting to farming and the high-rise city centres abandoned as monuments to failed 'development' as the electricity systems fail and hence the lifts, lighting and air conditioning fail. Urban farming, at present relatively marginal, will progressively take over the sites vacated by emptied-out cities as nature, with some human help, reclaims the urban surfaces.

The reversion to earlier social arrangements or to new arrangements that can function effectively under the new circumstances will not be a simple matter and although we can expect this to happen in radically different ways in different parts of the South, there are certain parameters which will be similar everywhere as a consequence of the recent processes of elite and new middle class induction into modernity. Not only will current 'modern' lifestyles prove to be extremely dysfunctional but also 'modern' thought processes, skills and capacities will show themselves to be unusable where orientation to local primary production and manufacturing have been destroyed by global economic processes, accomplishing a deep deskilling (Hobart, 1993). Who will rebuild local production and with what technologies and with what consequences for the rebuilding of urban settlements? Will these occupy the spaces between the abandoned monuments of modernity or will new towns and modest cities re-emerge on new sites? Will cities re-emerge at all?

Settlement patterns in Europe

We have come to be extremely self-satisfied with our cities in Europe, and do not like to admit that in fact suburban and exurban living is becoming something of a norm albeit expressing itself in different ways regarding densities, the relationship between

suburb and city centre and other parameters, as between countries. It is true of significant numbers of the European population that the car (increasingly large) is not a necessity to the same degree as for the American in the sense that we will have to abandon our suburbs once running cars on an everyday basis becomes too expensive. The cars that infest our urban streets will be largely abandoned (will they be removed to giant graveyards or left as a kind of tawdry decoration to decay along the urban kerbsides?), but for a while public transport systems may allow the settlement patterns to continue to function. However, with the intensification of energy-starvation, the food production systems and manufacturing will progressively return home as the global production and distribution system disintegrates and an increasing proportion of the population will be returning to farm the land.

One may speculate on how European societies will respond in terms of class formation and the outlook that goes with this: progress across the 20th century from societies predominantly of farmers, to those predominantly of workers in mines and factories to societies of predominantly service workers. This will now move backwards and without being in any position to predict where this will come to rest, one can nevertheless see immense problems of downsizing social expectations, spontaneous re-education and accompanying this problematic psychological adaptation that will impede any smooth transition to a reconstitution of urban networks.³⁷

Most of the larger European cities—and many smaller ones—now have a rich mix of foreign populations, truly local people constituting in some cases less than half. Furthermore, and in part overlapping with racially and ethnically distinct populations, increasing separation out of rich and poor has resulted in significant 'socially excluded' urban populations. The descent into energy poverty could well see mass starvation of these populations *in situ* and/or rebellion and violent social unrest as spontaneous

reaction to the deepening of discrimination and privation.³⁸ How will the survivors of these populations be treated and eventually integrated into the process of reconstructing local societies? With ghettos and concentration camps?

We can be sure that Europe is substantially over-populated relative to any notion of self-reliance and once the rest of the world can no longer be exploited (bringing the 'ecological footprints' back to the relatively local scale) and fuel is no longer available for intensive agricultural systems then Europe, too, will experience mass impoverishment right down to the level of famine and accompanying epidemic. This will proceed until the balance between population and relatively local production capacities are restored, the level of which will also depend on the level at which technologies and energy supplies come to rest.

The only circumstances analogous to this within living memory is the immediate period following the Second World War, mentioned above, where much of the population of the shattered cities of Germany wandered out into the countryside looking for means to survive (already by then urban-rural family ties had largely faded into history) and spent life sometimes for 2 or 3 years under such circumstances. At that time there were external authorities that helped re-establish the institutional and thence physical infrastructure to return to 20th-century 'normality'. This time round there will be no such assistance and people will have to come together *in situ* and build new institutions and places to organise life. The return to locally organised life will not be temporary but rather a return to life somewhat as it was many generations ago, or even in the Middle Ages.

Not even many of today's farmers will know how to farm under these circumstances and the making of appropriate farm implements and the raising of draft animals will take time. Electricity grids will fail and the sophisticated apparatus we use today to capture energy from renewable sources will fall into unrevivable disrepair and we will no longer have the sophisticated manufacturing

processes to continue to produce them. Of course we can have wind mills and burn biofuels as in the past and maybe the survivors will manage to develop modest means of capturing the energy of the sun within the constraints of available materials. In the first instance there will be little food or clothing or home heating or means of transport ...

It is pleasant to speculate that urban networks of relatively self-reliant modest cities, towns and villages such as those analysed by Walter Christaller in South Germany as recently as the 1930s will re-establish themselves.³⁹ However, a clear view of what has happened over the past half century reveals not only extensive suburbs but also medium and high-rise urban development, commercial and industrial centres, highways and so on taking up areas of countryside (and presenting such dangerous legacies as abandoned nuclear power stations and chemical complexes) where there will be inadequate resources to clear these away. Initially life will be a question of survival in the interstices with urban farming also emerging here and the necessity to reinvent technologies and products that can be made and maintained at a relatively local level, reviving manufacturing skills and returning to the use of local materials: many materials out of which we build today's world such as aluminium and plastics will virtually disappear and even iron and steel may become available only from recovery of the flotsam of our era. Thus it is likely to take an extended period to revive effective urban networks, if they should indeed revive at all as this presupposes also a fundamental change in beliefs about what life is all about. It also presupposes the reconstitution of denser social organisational systems and that global warming will not completely destroy the capacity of ecosystems to supply basic materials.

Settlement patterns in the USA

There is a rapidly rising debate in the USA about the coming unviability of suburbia

(Heinberg, 2003; Electric Wallpaper Co., 2004; Kunstler, 2005) which today are the dominant form of settlement pattern in the USA. Recent debates about American suburbia—in which contributors to *CITY* have been active (Bell, 2007)—highlight that these are by no means homogenous. They include poor, neglected communities of aging mobile homes comparable to slums in southern cities; Levittown-type relatively higher density housing with ‘yards’ spread over vast landscapes in a quasi-orderly fashion interspersed with commercial strips and malls; and ‘exurbs’ of the richer end of the social spectrum, scattered at extremely low densities across the landscape. There are also very different social milieux involved with a tendency for individual suburbs to be socially extremely homogenous.

Ostensibly, US suburbs house an ‘average’ middle-class American. But in practice there are substantial social differences between suburbs. We might thus presume that in the first instance there will be decline at the lower end of the income spectrum with a piecemeal abandonment of houses. This will in part be forced on many by defaults on housing loans but, no longer being able to afford to drive long journeys, people will search for a place where they can settle within a relatively short distance of the functions of life: work, commercial and social services. In theory, new, denser settlements would re-emerge—and the current debate in the USA is that the ‘New Urbanism’ is seen as the start of what will become the norm within the coming decades. The basic problem here will be the declining amounts of energy with which to undertake the massive rebuilding which this migration of population suggests and hence the escalating expense that will exclude precisely the rapidly impoverishing population in most urgent need of re-housing.

Certainly, as elsewhere, the high-rise city centres—the greatest monuments to the hubris of modernity—will be abandoned with a greater loss of resources than elsewhere—other perhaps than in Latin American cities (one thinks in particular of São Paulo)—due

to the greater degree than elsewhere in the world of reliance in the city centres on high-rise structures. At the same time, much of the USA which is semi-desert that has been made habitable—in some cases supporting large cities—through the use of huge energy resources will become almost entirely uninhabitable, triggering mass migrations back to the north of the country. In principle the USA has a relatively small population in relation to its agricultural resource potential—certainly when compared with Europe. Whether, however, the reconfiguration of the use of these resources under conditions of reduced energy availability and substantial relocation of populations to benefit from these resources (returning to farming) will avert the famines that can be expected elsewhere in the world is entirely unclear—being a function in the end of whether some kind of organised strategy emerges as opposed to a more likely chaotic process of mass migration and land squatting accompanied by considerable violence.

The emerging American literature on the end of oil speculates on the kinds of towns and cities that will emerge (Heinberg, 2004; Kunstler, 2005). One suggestion is a reversion to the manufacturing towns of the late 19th and early 20th century. However, this still assumes a country-wide system of resource distribution and as this ebbs away and the transport systems cease to function effectively over long distances, localities will necessarily become increasingly self-reliant and in time (within decades) we might expect the USA to break up into regional political as well as economic entities. How the population will come to terms with the abandonment of the homogeneity of suburban life and learn to live again amongst people not of their own kind and to cooperate intensively with them in a new division of labour would seem to pose an even greater socio-psychological adjustment problematic than in Europe.⁴⁰ Given the American tendency towards dysfunctional religious expression and to violence, one might be excused for a deep pessimism with regard to any possibility of an even vaguely smooth transition to the new circumstances

and it is easy to imagine arrangements considerably less congenial than those that might emerge in countries of the South.

In sum, we can expect to see much of the urban structure of today all around the world being abandoned or with greatly reduced populations clustering on urban edges or in new peri-urban and rural towns. Existing smaller cities and towns in areas where a dense agriculture is possible may survive and even revive against their relative decline in recent years. But the structures in terms of land use and buildings will be adapted to conditions of low-energy which will square with much of the older building fabric but will involve the salvaging of building materials from abandoned suburbs and city centres as the basis for construction under the new conditions. The outcomes in terms of the configuration of human settlements will depend, however, greatly on the evolution of attitudes, outlooks and socio-political restructuring processes and at the end of this essay I want to take a brief look at this problematic.

Coda

This all sounds extremely misanthropic. Surely things will not be so catastrophic: surely something can and will be done to mitigate the collapse and allow some semblance of the modern world to survive? Well, we can be sure that as the global system of resource exploitation, production and distribution starts to be disrupted that it will, in the first instance, have very different impacts on different countries. One can even imagine Sweden—that already has a commission investigating the exit from oil by 2020 (Commission on Oil Independence, 2006)—as surviving as an island of modernity: it is blessed with abundant natural resources and a relatively small population and a dense modern productive system—although there would need to be a crash programme to substitute many foreign made modern products hidden within things otherwise made in Sweden.

Brazil is another case. Although the population is rising fast, it still has a vast resource base per head of population, has developed renewable energy sources to a point where these supply over 40 per cent of energy needs⁴¹ in an economy that is head and shoulders above any other Latin American economy in terms of density of industrial production system. It, too, would need to work hard on indigenising a good deal more of resource supplies and modern production if it were to survive as a ‘modern’ island in a collapsing world economy.

By contrast, the great production power houses of Germany and Japan stand little chance of protecting themselves from the impacts of the decline in fossil fuels; and the UK, as the North Sea oil and gas resources decline, and having largely de-industrialised and even managed to spoil much of its remaining coal resources,⁴² stands to bear the worst consequences of energy decline as the global financial system upon which so much of present-day UK wealth rests falls apart.

However, once the collapse sets in, the dense interdependence of our globalised world will be subject to strains, then shattering right across the system against which no modern state will be able to insulate itself, even if the impacts are differential. The whole orientation of political relations and structures of production and distribution will be violently torn apart ending in all probability, discussed by Tainter (1988) and referred to in the previous essay in this trilogy as the usual end result of the collapse of complex societies (Atkinson, 2007b), in much smaller political entities with substantially simplified information and production systems and consumption patterns.

So when I speak in various places in these essays of possibilities to plan for an energy-poor world, what do I mean? We cannot say too much about the mental state that will allow this to proceed beyond that there will have to be a generalised *orientation to a downward passage and an ultimate ‘steady state’ society and economy* that clearly is a state of mind totally foreign to occidental

thought.⁴³ There will be temptations to aim and then plan for a state part way down the slope, such as the current conventional literature that has come to recognise the energy crunch referred to in the first part of this essay,⁴⁴ and Hirsch *et al.* (2005, p. 6), as the most ‘realistic’ of official observers in practice warn *against* planning beyond what we can see in the relatively short term.⁴⁵

It seems to me, however, that we should try, rather, to bring the bottom of the precipice into as sharp a focus as we can and start now to devise workable arrangement in at least institutional, organisational and technical terms rather than aiming to adopt partial goals, achievable just as the downward slope starts to steepen but where we have no plans to deal with the accelerating downward passage. Of course at the present time planning the downward slope in any form would be seen by virtually the totality of humanity as ‘off the wall’ as the collapse is still not in sight and even when it does become evident there will remain desperate hopes that it is temporary, screening out realistic proposals for the reality of several decades ahead.

However, as discussed in the previous essay in this trilogy (Atkinson, 2007b), occidental society has always been accompanied by ‘alternatives’ that I referred to earlier as the ‘utopian tradition’, although in its guise as ‘actually existing socialism’ or ‘communist society’ we might have problems fitting this into the concept of utopia. I should therefore say here what I mean by the term as there are many views of the meaning of utopia. In its original form—Thomas More’s (1965) vision of 1516—utopia was the term given to an ideally organised social and political world and this is how it is meant here: as a real alternative by design.⁴⁶ Liberalism does not actually believe it is possible to design a better world—and in the extreme attacks the idea of utopia as being necessarily totalitarian and coercive as expressed in political philosophy (Popper, 1945) and in a ‘dystopian’ literature across the 20th century (Kateb, 1963; Kumar, 1987). Alternatively, utopia is seen as maybe a beautiful idea but inherently

unachievable, as a dream or purely literary world.

It is necessary here to confront the current eclipse of the utopian tradition in Europe, because this will be a vital resource in the Occident to those, in the coming decades, who have the aspiration and the moral courage to salvage society from the devastation which the collapse will bring about. It is ironic to the point of poetic how Anglo-Saxon culture, so deeply culpable, ideologically and in lived praxis, for the messianic descent into liberalism, has also been historically productive of utopian alternatives from Thomas More, through the radicals of the English Revolution (Hill, 1975) and 19th-century Owenite movement to present-day intentional communities. Yet the misanthrope Thomas Hobbes prevails: the philosophy that asserts that human beings are fundamentally selfish and require external power to force (unhappy) compromises in order that the world should function at all.

This is the vision of liberal individualism that has encouraged reckless consumerism as an escape from social conflict and that is now precipitating catastrophe on an unimaginable scale. It is, however, a sordidly perverse view of human inclinations and capacities fundamentally contrary to reality. This has been expressed by Carol Gilligan: ‘The question is no longer how do we become capable of love and knowledge, but rather what keeps us from loving and knowing.’ (The full quotation is given by Bob Catterall, 2005, p. 150. The topic is further discussed by him, in relation to black cultural struggle, in 2002, p. 151 and 2006, p. 117). Every society displays, when one cares to look in this direction, the instinctive empathy—indeed, the absolute need and capacity—in every last human being, if not actually to love, then at least to engage positively with her and his fellow humanity as the fundamental basis of human self-fulfilment. Life starts only where we enter into relation with others to create our environment in nature. Whilst the history of civilisation since the advent of the Neolithic Revolution has been one of division and domination/submission, there is no

'human nature' at a more fundamental level that stands in the way of a world created not as the product of individuals but of mutual vision and activity aimed at satisfying the needs of *all* humanity. But we must overcome our culturally-created fears, blockages, defences—and untrustworthiness—and learn to believe in this alternative and act accordingly.

Of course the liberal sensibility sees any form of agreement to act together as a potential infringement upon personal liberty and integrity. Hence the more coherent utopian strategies become, the more these come to be seen as totalitarian, despotic. But what if decisions are reached through participatory democracy? Still the liberal insists dogmatically that there is inevitably a minority that will be overrun by the majority or an elite that asserts its prerogative through violence. But is this necessarily so? Of course the natural world has structures to which we must conform—and our disregard for nature in the recent past will surely result in harrowing circumstances of hard labour at the bottom of the precipice with which those who have the will to survive will have to come to terms. If, however, we reject our incorrigible liberal individual pride and dogma and empathise with our fellow humanity as local community, then life can be rebuilt in a way that satisfies all our needs in the simplest manner: no need for cars or hand-phones or any of the rest of the grotesquery of the over-productive consumer society. It is fundamentally a matter of belief which is then lived by, freed of the historic nightmare of hierarchical society.

The failure of liberal society—the belief and life built upon this that asserts that if we all look after ourselves we will look after society better than if we try to improve society—that will be the clear outcome of the collapse of modern civilisation would seem to indicate rather strongly that we should start to think of a way of organising society so that it satisfies our human needs and is sustainable in the sense of looking after the post-collapse ecological context. It is histori-

cally interesting to note that the Soviet Union, representing through much of the 20th century the main alternative to liberalism, was a real life attempt to design a particular form of society and then to implement it. However much it might be seen today as a failure, it is unfortunate that its successes are no longer acknowledged nor, more importantly, how those successes might have been built upon to improve on the experiment. It is indeed notable that prior to the Russian Revolution the Russian Communist Party did debate real alternatives (Lenin, 1973a [1902], 1973b [1917]). In recent years there has been wide-ranging debate about alternative social and political arrangements that has hardly been taken notice of by the public media but which has been expressed both through the writing and action of 'social movements' and more specifically the action of 'intentional communities' referred to earlier in this essay.

Amory Starr (2000) made a useful analysis of the manifold debates and tendencies in the critique of present-day society, clustering them into three general types: those who believe that existing institutional structures can be reformed, those who believe that there can be an alternative form of globalisation and those who believe in the need for radical decentralisation and local democratic control over resources and decision-making. Overwhelmingly the assumption is that these alternatives will themselves have to be responsible for changing the world rather than that they should be conceived of as means of reconstructing the world after the collapse of the present.⁴⁷ I think we can dismiss the first option out of hand as being rendered entirely irrelevant in the face of the collapse. I also, however, believe that the second option can no longer be thought viable under the conditions 'at the base of the precipice' where today's 'globalised' world will have evaporated and activity and accompanying outlooks returned perforce predominantly to the local, or at best sub-regional, level.

On the academic front there has been a massive outpouring of material concerned

with 'green politics' aimed at determining what might be an adequate political process to overcome environmental problems and also discussing progress in green politics on the part of green political parties and other organised 'green' political initiatives.⁴⁸ Whilst most of this is motivated by the idea that what is happening around us today is unsustainable, nowhere is there recognition that we might actually experience collapse before any effective action is taken, and hence focusing on what might be relevant to life thereafter. It is not at all clear whether much or even any of this has value for rethinking and reorganising life post-collapse. On the one hand we are confronted with very internalised theoretical debates that are academic in the negative sense (almost wholly restricted to a small group of academic teachers and researchers with very questionable relevance to anything in the real world) and on the other hand it discusses green politics as they are being played out in today's world of green parties and environmental non-government organisations that are deeply engaged in today's world but cannot be expected to contribute much to a post-collapse future.

Most of the 'alternative' initiatives and ideas are of a fragmentary nature: coming together since the year 2000 in the annual World Social Forum and more recently regional and local fora. Here we see hundreds of 'workshops' where these ideas and activities are presented and discussed with very little of enough substance that they could be presented even as components of a *coherent* alternative world.⁴⁹ The nearest that comes to this is the International Forum on Globalization's (2004) *Alternatives to Economic Globalization—A Better World is Possible*.⁵⁰ The attempt here is to assemble a wide range of critics of the present world system from both northern and southern countries and see whether a united alternative vision can be created. Meanwhile, a number of other more or less coherent 'schools' continue to develop their proposals ranging from 'eco-socialism' that essentially

tries to revive the socialist project taking greater account of ecological issues (Red-Green Study Group, 1995; Kovel, 2002) to 'social ecology' that takes its cue from the ideas of the 'anarchist ecologist' Murray Bookchin (1980, 1982, 1989; Clerk, 1990) and Takis Fotopoulos' (1997) 'inclusive democracy'.⁵¹ In addition there are attempts to propose coherent alternatives to the modern capitalist growth economy that inevitably also include proposals for changed social arrangements (Daly and Cobb, 1989; Albert, 2003⁵²).

Whilst I have no desire here to enter any of the disputes regarding which alternative is correct and why the others are making mistakes (there are unfortunately all too many such—often hair-splitting—altercations) I would like to emphasise two related things. Firstly, from here on it becomes urgently necessary to think of alternatives in terms of the end conditions we are likely to see 'at the bottom of the precipice'. Secondly, this is no longer a game of hoping for radical reform or revolution (Harvey, 2000, p. 257 et seq.) but rather having to engage with a world which is forcing change of an entirely different kind and will desperately need coherent solutions. And although we might think about some overall (maybe we should say moral, ethical) rules, when it comes to more concrete proposals such as political decision-making processes, production processes, 'distributional justice' and so forth, it will be far more important to devise relatively local solution. For this reason my tendency has been to develop ideas around the concept of bio-regionalism. This is indeed one of the contending paths being debated in the 'alternative' literature and social movement initiatives—of which it should be said in truth that has tended to be criticised by those, particularly coming from socialist traditions informed by Enlightenment universalist heroics, who have an instinctive antipathy to 'parochial' localism.

In the first essay of this trilogy, I mentioned in passing (Atkinson, 2007a, p. 205) the bioregional movement, involving a discourse and

practical experiences that aims at defining a world of modestly sized spatial units in which local cultures live sustainably, relying predominantly on local resources (self-reliant but not necessarily self-sufficient). In my own contribution to this debate in the early 1990s I ended on the following note (Atkinson, 1992, p. 350):

'The question is: do we have the courage to choose this, or will we simply wait until the wave breaks over our heads and plunges us unwillingly into bioregional arrangements of an altogether less congenial kind?'

In the intervening years the term 'bioregionalism' has come to be used in all sorts of circumstances many of which have little or nothing to do with a future sustainable civilisation.⁵³ However, anyone interested in the idea of planning for a future of sustainable regions that we can expect to be the only truly sustainable end-of-the-collapse state of existence would do well to look into what has become a significant literature on bioregionalism (Sale, 1985; Andruss *et al.*, 1990; McGinnis, 1999; Carr, 2004).⁵⁴ Here we see attempts to think (perhaps 'feel') their way into social (cultural) relations that abandon the whole sorry history of the struggle to accumulate and dominate that has characterised 'civilisation', with a return—in a new state of knowledge and experience—to mutualistic arrangements that produce an easy life, 'living lightly' in harmony with the particular corner of nature in which they find themselves.

Almost all of this literature is, however, North American and even there fails to come to grips with the fact of the dominant present-day urban and suburban culture and how to traverse the road between this reality and the bioregional future. Whilst it is a hopeful start to pointing the way to fundamental change in outlook that will be needed there, it is not necessarily easily adaptable in the form in which it currently appears even to European conditions, let alone those of more distant cultures (albeit it has had a strong resonance in the Zapatista movement in Mexico) such that the concept will need to

be thoroughly rethought for other places—and may be deemed in some circumstances to be irrelevant.

In discussing earlier in this essay and relating back to the previous essay in this trilogy (Atkinson, 2007b) the impacts of energy-starvation on cities passing reference was made to the immense difficulties there will be in rebuilding dense face-to-face social relations—and relations of production—from the extreme loosening of relations we have seen in recent years, increasingly articulated via the ever more elaborate techno-structure. No more communication by hand-phone and e-mail, no more easy escape by car or aeroplane, not even escape into television viewing; back to face-to-face interaction and forms of work that will require a good deal of manual labour. The bioregions literature, spanning between geography and romanticism is strongly concerned with the rebuilding of affective relations of functioning communities resonating with particular natural settings but focuses little attention on systems of production⁵⁵ and how the economic and political relations in a confederal world of bioregions might be constituted.

It would seem that the bioregions movement, being generally anarchistically inclined, would like to see their bioregions organised on the basis of egalitarian social and economic relations. However, although they may be discredited and even disoriented, today's elites are likely to adjust themselves to post-collapse realities and we might even see the (re)emergence of feudalism. It is unlikely that egalitarian relations will emerge of their own accord without specific, coherent ideas of how people should engage in relations of production and reproduction and then engage in social movements (maybe 'revolutionary struggle') to secure such relations in the post-collapse context. Perhaps over much of the North we will see the emergence of a patchwork something like late medieval Switzerland with small cantons organised on different socio-political bases ranging from the anarchistic republics of central Switzerland (Schwyz, Uri and Unterwalden) through oligarchically

organised towns (Zürich, Bern, Basel and Geneva), church-dominated feudal rural areas (e.g. Wallis and St Gallen) to the odd petty principedom (Lichtenstein). Or perhaps the vast variety of forms of governance that evolved in pre-Columbian America will be the more distant point of arrival. What kind of residual or reconstituted larger framework might emerge is something that can only be imaginatively speculated upon.

I would recommend that anyone interested in anticipating the collapse, thinking through the longer-term consequences and then engaging in wider debate and action should start, not with thinking technically how to organise bioregions so much as by thinking about moral and ethical—socio-political—issues.⁵⁶ I believe that two things must be confronted. On the one hand how do we see relations between people being organised in re-establishing local productive and reproductive systems? How do we table and disseminate our ideas on these issues, inevitably contentious and unlikely to proceed without—possibly harrowing—conflict? On the other hand, it will be necessary to forge an ethics of relations between the human and the natural world that will go way beyond anything known to any previous society, given our modern knowledge of the inner structures of nature and our proven capacity to use this knowledge—overwhelmingly inadvertently—in the destruction of our living environment. A start has been made in this direction in the form of the ‘environmental ethics’ discourse which, unfortunately, seems almost entirely to avoid issues of social relations as if these will take care of themselves. In the end, we will need—assuming there is a world at all beyond the collapse—a consolidated ethical system to solve our existential problems that is fulfilling for everyone and truly sustainable.

Appendix: Time line on collapse

Some readers of the draft of this essay have been frustrated by what seems to be a confu-

sion of dates when the various stages of collapse will occur. Of course it is not possible in any way to predict particular events but I have tried to estimate by when certain things will manifest themselves and when we might expect to see sudden events. This appendix sets out this time line—or time lines—free of the surrounding discussion, so readers can consider themselves what might happen when and begin to work their own way into scenario-building for purposes of determining what to do ...

1. In the previous essay (Atkinson, 2007b) concerning the demise of cars at the centre of our lives, I mention ‘probably between one and two decades’ as the time it will take for the use of cars (and air travel) to become a rarity and us finding our streets full of ‘dead’ cars and empty motorways and airports. This relates obviously to the International Energy Agency’s warning of an ‘oil crunch’ in 5 years and assumes this will bite deeper and deeper such that within two decades and possibly earlier the amount of car use will have declined precipitately. Assuming they are not desperately impoverished, people might still use their cars very occasionally but no more with the kind of abandon we see today.
2. I state at the end of the first section, on the General Scenario, entitled ‘What is so Far Acknowledged’, summarising the argument concerning the main influences determining the date when the energy decline could start, that this could be anywhere between inside the next 10 years (post-‘peak oil’ without substantial investment in ‘alternatives’) and the middle of the century. The latter date will depend almost entirely on the rapidity with which oil from unconventional sources and coal liquefaction come on stream (and hardly at all on any eventual crash programme of investment in nuclear power or renewables).
3. Obviously the start of the downward path is the signal for rapidly rising prices

(i.e. petrol prices rising to tens and even hundreds of dollars a gallon over 2 or 3 years) but not yet, necessarily an immediate precipitate fall in the availability of oil for what will be increasingly 'essential' functions. Food prices—and the cost of life generally—will, however, also rise precipitately.

4. The downward passage of energy availability is indicated in various places in this essay to be something that will accelerate. The rate of acceleration will be influenced by various contingencies. I note that if it occurs sooner then there may be scope for planning the results in some way but if later (due to massive investment in 'unconventional' oil sources and coal liquefaction) then the decline will be later but more precipitate and have further to fall.
5. I then speculate that the fall could come earlier than it would simply as a consequence of failing resources, as a result of the collapse of the US economy that will bring the global economy down with it as a consequence of the impact of declining demand by the US economy on economies worldwide.
6. Once the decline has proceeded a certain way, it will then feed on itself as finance for continued exploitation of oil will fail to materialise. It is clearly no more than speculation to estimate how long this might take but I would hazard a guess that there is likely to be something like 5–10 years between the start of the downturn and arrival 'at the precipice' after which it is likely to be extremely rapid, resulting in the collapse of electricity grids, agricultural systems, the global production system as such and modern urban and suburban lifestyles. This is where we can expect populations worldwide to crash. It is unlikely that this will occur much later than the middle of the century and could occur considerably earlier.
7. Nevertheless, we might expect impacts to be very different in different parts of the

world and even over quite short distances (within subcontinents) as a consequence of the varying rapidity with which local production systems can be re-established, largely free of the need for imports over long distances. Of course even the relative successes will be subjected to the unfolding impacts of global warming progressively changing climate and hence ecological systems and with the seas rising. The IPCC has indicated that these may be expected to continue unfolding over the next few centuries without any foreseeable bottoming out—and could eventually lead to the radical deterioration of ecosystems everywhere and to the extinction of mankind.

Notes

- 1 Front cover, *Fortune*, Vol. 156, No. 4, 3 September 2007.
- 2 Lead story, page 11, *Fortune*, Vol. 156, No. 7, 15 October 2007.
- 3 A small box on page 14 of the 3 September issue of *Fortune*, in commenting on the IEA announcement of a growing oil production shortfall noted in the opening box to the second of this trilogy of essays (Atkinson, 2007b), stated that: 'As prices inch higher, some experts are saying that a global energy crunch will make \$80-a-barrel seem tame ... Analysts say OPEC and others can keep oil prices below \$80 in the short run especially with refineries at capacity and autumn on the way. But next summer will be a whole new story.' Already before the end of the year the per-barrel price has exceeded \$100.
- 4 *Fortune*, Vol. 156, No. 7, p. 89.
- 5 I use here Jared Diamond's approach (2005) to understanding such collapses where there are generally means to steer a society into a sustainable path that are ignored.
- 6 I discussed this in a little detail in the first essay in this trilogy (Atkinson, 2007a).
- 7 The penchant of most US writers focusing on the energy difficulties ahead is to seek ways to maintain present-day lifestyles (Roberts, 2004; Leeb, 2006; Tertzakian, 2006). Jared Diamond (2005) following his realistic discussion of the collapse of previous societies then goes on to assume that the present organisation of life in the USA can continue with minor adjustments—entirely vitiating his own warning that collapse is mainly a

question of societies being prepared to change 'core values' (see: Smith, 2005).

- 8 There are also inevitably those (opportunists?)—for example, Huber and Mills (2005)—who wish to assure the public that all is well and that in spite of emerging difficulties, these will be solved before the going gets too rough.
- 9 Roberts (2004) notes throughout his analysis the deep resistance in the current US government and beyond that the cultural embeddedness in US capitalism to accepting energy conservation policies or even any significant shift in investment out of oil and gas into almost any other energy source.
- 10 See McKillop (2005) for a brief historic view of 'oil wars'. See also Heinberg (2004, ch. 2). For a perceptive discussion of the US attitude and possibilities regarding Iran, see Strahan (2007, pp. 178–181).
- 11 Matthew Simmons, oil industry investment banker and advisor to the US administration, has been publicly outspoken in the clarity of his statement of the coming energy problems (Kunstler, 2005, p. 30; Strahan, 2007). Analyses of existing information on discussions amongst key members of the US administration and also Tony Blair indicate clearly the extent of knowledge and also attitudes concerning what to do about the coming energy crisis. See also Hirsch *et al.* (2005) discussed further below.
- 12 Perhaps we should note a certain ambivalence in the IEA report in that the opening sentence states boldly: 'The energy future which we are creating is unsustainable.' However, whilst more attention is paid to the Alternative Policy Scenario than in the past, the Reference Scenario—that is clearly what is meant by 'unsustainable'—maintains pride of place in the document. Nor does the Alternative Policy Scenario yet indicate a downward trend in energy consumption, merely a less steep climb.
- 13 Already in the 1980s, impressively large wind farms were appearing in California due to promotion programmes and whilst these have grown relatively modestly in the USA (particularly more recently in Texas), the countryside of many European countries—particularly Denmark, Germany and Spain—are now graced with tens of thousands of wind generators.
- 14 An EU Directive of 2003 envisages 5.75 per cent of transport fuel in the EU should derive from biofuels by the year 2010. In April 2006 President Bush's four-part energy plan to combat high gasoline prices included an intention '... to increase the use of ethanol, improve hybrid vehicles and develop hydrogen technology'.
- 15 The 2006 IEA (2006) reference scenario sees energy from renewable sources as increasing by a further 40 per cent by 2030 but that this will barely keep up with the general global rate of increase in energy demand, remaining at 14 per cent of the total. If energy from fossil fuels starts to fall back already before 2030 then the renewable sources of energy will certainly not be able to do much to compensate.
- 16 See the box at the outset of the previous instalment of 'Cities after Oil' (Atkinson, 2007b).
- 17 The focus which is always upon growth rates entirely misses the point where even a 20 per cent per annum growth rate in China would result in a smaller per capita increase than a 2 per cent growth rate in the USA or Europe. In the last decade GNI per capita amongst the rich countries has increased on average by around \$10,000 with Germany now around \$35,000 to Denmark around \$48,000, the difference covering most of the OECD countries. The current level in China is approximately \$2000 and that of India \$800.
- 18 In fact the current price of liquid fuels made from coal is only \$35 a barrel which, with current oil prices nearing \$100 should encourage private investment (www.en.wikipedia.org/wiki/coal/ accessed 15 September 2006). For an assessment of possibilities for the US shale oil resources—and a general assessment of North American oil shale resources see Johnson *et al.* (2004).
- 19 The current technology for recovering oil from tar sands demands large inputs of natural gas which may no longer be available in the near future. So far alternative means of recovery are only in the research stage.
- 20 Apparently Hirsch's prognostications were seen sceptically by some such that he produced a subsequent report, financed by the US Department of Energy (Hirsch, 2007), in which he quoted a wide range of energy experts concerning their estimates of when we might expect 'peak oil' to manifest itself with most of them expecting this within the near future.
- 21 As noted above, shortly after the publication of the first essay of this trilogy, the IEA announced dramatically—reported on the front page of the *Financial Times* (10 July 2007)—that we can expect the oil peak already in 5 years.
- 22 See *Fortune* European Edition, Vol. 154, No. 4, p. 15.
- 23 In fact the demise of major car producers—Fiat, Chrysler, even General Motors—has been imminently expected from time to time but somehow the day was always saved.
- 24 See *Fortune* magazine Vol. 156, No. 4 entitled 'Market Shock 2007 (Now What?)'.
- 25 Nitrogenous fertiliser is made from natural gas which very soon could go into a steep decline in production. Phosphate fertiliser on the other hand is mined independent of fossil fuels but is expected to run into supply problems within the near future.
- 26 See Kates (2004a) for an excellent presentation of these debates. Also Kates (2004b) and Warner

- (2004). All manner of solutions are presented but remain of marginal interest to the ongoing political process.
- 27 Some, particularly Asian, countries—and most notably China—have had policies to reduce population growth, none of which, however, have been a notable success.
 - 28 Hardin (1968) suggested we must institute a regime of ‘mutual coercion, mutually agreed by the majority of people effected’ (p. 1247) to avoid environmental and demographic disaster.
 - 29 Judging by the statement of the IEA on 9 July that ‘gas markets will be tight already by the turn of the decade’, the failure of gas networks may be one of the early symptoms of the decline in energy, resulting in millions of households no longer being able adequately to heat their houses or to cook! But more seriously resulting in the failure of what is currently feedstock for a whole range of vital industrial products from fertilizers through plastics to the processing of tar sands (and hence the failure of the current rescue plan for oil).
 - 30 The Fellowship for Intentional Community (FIC) (www.ic.org) is an umbrella for intentional communities in North America. Its 2007 directory (also available online) lists almost 900 intentional communities or proto-communities in North America and another 325 elsewhere in the world. A European directory is published by Eurotopia (www.eurotopia.de) in Germany. In the UK, ‘Diggers and Dreamers’ (www.diggersanddreamers.org.uk) fulfils this function and has since 1990 published a biannual directory of communities in the UK, each edition including a series of articles on aspects and intentions of intentional communities.
 - 31 Most recently with the formation of the ‘Global Leadership for Climate Action’ (2007) involving high-level political negotiations to achieve more concerted measures to reduce greenhouse emissions than has been achievable under the Kyoto Protocol (see: www.globalclimateaction.com).
 - 32 This is confirmed in their more recent *World Energy Outlook 2007* (IEA, 2007).
 - 33 The *Alternative Policy Scenario* in the *World Energy Outlook 2007*, although considerably more ‘aggressive’ than in previous years in proposing measures to reduce greenhouse gases still envisages CO₂ emissions in 2030 to be a quarter as much again as today.
 - 34 It is an interesting fact that following the end of the last ice age, 20,000 years ago, the seas rose by some 140 metres with the current level—that is, followed by a period of more or less stable sea levels—having been achieved some 8000 years ago.
 - 35 I noted in the second essay of this trilogy the generous use of the word ‘catastrophic’ in the World Bank (2006) *Global Economic Prospects 2007* (Chapter 5) when referring to the impacts of global warming if immediate steps are not taken to curtail the output of greenhouse gases.
 - 36 I should note that I personally discuss this endlessly with almost anyone I meet and find widespread acknowledgement and agreement—that makes the lack of *public* debate seem rather extraordinary!
 - 37 Perhaps the great relief of the post-modern dissolution of society (Bauman, 2002) was that the indignity of class distinction became less evident. So its re-emergence in the process of collapse will certainly appear extremely painful for all but those who somehow manage to stay on top. Unless, of course, spontaneous socio-political movements arise to insist that post-collapse societies be radically egalitarian (see below).
 - 38 The issue of increasingly socially problematic suburbs of northern cities has been a recurring theme of *CITY*. See particularly the discussion of the work of Loïc Wacquant in the last issue of the journal (Chatterton *et al.*, 2007).
 - 39 This is not, however, true for the UK where already in the first flush of industrialisation and urbanisation, by the mid-19th century different cities had come to specialise in different products that were then distributed around the country—and indeed around the world—by the rapidly developing national and global transport system.
 - 40 I find myself again ruminating over Zygmunt Bauman’s analysis (2001, 2002) of today’s (non)society and (non)community that seem to be both the cause and consequence of modernisation and post-modernity.
 - 41 This resulted in the IEA (2006, ch. 16) writing a special chapter on Brazil (and no other country) in the *World Energy Outlook 2006*.
 - 42 Huge areas of the UK were underlain by coal but much has already been exploited and with the abandonment of the industry closed mines become flooded and collapse making them extremely difficult to revive.
 - 43 Even the Green Movement found it very difficult to accept and state forthrightly that the future would be not only less resource-using but also be organised on the basis of a ‘steady state’ economy. An outstanding exception to this is Herman Daly (1973, 1977, 1996) who over the years wrote extensively on the need to face the inevitable eventual steady state economy and for some years worked for the World Bank, attempting to convince this institution of the wisdom of steady state economics!
 - 44 See note 3 above.
 - 45 The so-called Hirsch Report then urges the US administration to go down the disastrous path of exploiting unconventional fossil fuel resources.
 - 46 There has been much useful discussion of utopia as a political alternative in past decades that has

- recently been in decline. See: Manuel (1965), Goodwin and Taylor (1982), Levitas (1990) and Kumar (1991). My own views on the matter can be found in Atkinson (1991, pp. 115–124).
- 47 See Dauncey (1988) for an exception—albeit the ‘crash’ which he envisaged was extremely soft.
- 48 A small selection of texts on green politics might include: Capra and Spretnak (1984), Rüdiger (1990, 1992, 1995), Eckersley (1992), Goodin (1992), O’Niell (1993), Dobson (1995), Conley (1997), Dryzek (1997), Barry (1999), Carter (1999) and Radcliffe (2000). See also the journal *Environmental Politics*.
- 49 The slogan of the World Social Forum is ‘Another World is Possible!’
- 50 See also Centre Tricontinental (2001). The initiatives referred to here fall squarely into the category of ‘an alternative globalisation’.
- 51 Takis Fotopoulos edited a journal entitled *Democracy and Nature* for a number of years in the pages of which was a running debate around his ideas and what appeared as his rivals.
- 52 See debates in the website www.zmag.org
- 53 Where in Germany the term ‘bioregions’ is being used in the promotion of biotechnologies and elsewhere to promote tourism or, slightly nearer the original, in Austria denoting regions focusing on organic agriculture but without any interest in the comprehensive reworking of regions intended in the original usage.
- 54 My own major criticism of this literature and practice (and this has been a major failing right across the Green Movement including Green Party politics) is the very weak focus on how coherent manufacturing systems are going to be re-established in the context of bioregions, based predominantly on local resources.
- 55 Carr’s discussion (2004, 54 et seq.) of Marshall Sahlins’ (1974) and related theorising of pre-civil mutualistic socio-economic relations is a good start albeit it is very distant from what will be the immediate practical problems of post-collapse survival strategies.
- 56 And here, in spite of the scepticism I express above, there may be useful ideas buried in the massive literature of green values and politics that can be applied towards forging moral and political structures relevant to life post-collapse.
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