

Climate Reds: Responding to Global Warming with Relative Optimism



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Fig.1
J.M.W. Turner's *Sunset*, c.1816

Coping with climate change invites input from historians.¹ Put briefly, this article takes a relatively optimistic long-term view. Yet that relative good cheer is emphatically not based upon climate-change denial. Instead, it is built upon a realistic expectation that enough people and enough governments will eventually awake and take countervailing action, even if late in the day. Humans often flirt with crisis. They do also rally when the need for action overrides the costs of doing so.

This is the view of one historian. Others totally disagree, as shown in Mark Levene's paired article: 'Climate Blues'. But such disagreements go to the nub of the matter. Are humans more meddlesome and destructive of their environment (both local and global) than they are

inventive and resourceful at coping with crises and finding responses? The answer is vital, since there is universal recognition that humans (and all other species too) are totally reliant upon their/our only viable macro-environment: Earth.

These two utterly differing contributions do, however, share a common view that historians, as experts on the human past, need to join the debates about the very long-term. After all, the whole climate-change thesis links a long-term historical analysis undertaken by climatologists into a predictive future.² Climate-change deniers offer alternative long-term views. Some doubt the basic data. Others prefer rival models that do not deny climate fluctuations but which identify causes other than human interventions, such as variations in solar activity.³ Meanwhile, those sociologists, who then devote time to analysing why some people do doubt or deny,⁴ are also reflecting upon the ways in which humans situate themselves within long-term perspectives. Historians are therefore joining an already crowded and disputed terrain. Some implications of climate-change for historical studies (and *vice versa*) are accordingly discussed here briefly – under the following three headings:

Firstly: Climate Change under cuts Progress Narratives

Are there many people in the world who still consider History to be a narrative of unalloyed Progress? If so, they should be rethinking now.

Such an optimistic viewpoint was prominent in western thought in the later eighteenth and nineteenth centuries,⁵ although it was never universally endorsed. It is sometimes described as ‘Enlightenment optimism’, often in a rather caricatured version. The metaphor invoked to signal Progress is often one of gradual ascent. The imagery has echoes of the Christian vision of salvation as marching towards a radiant city ‘on a hill’. For one expression of the optimism felt as a result of intellectual, scientific and technological advances, consider the following words from a radical book-seller in England in 1795:⁶

Man [*sic*] is a progressive animal, and his advance towards improvement is a pleasurable state. Hope cheers his path as he toils *up the hill* that leads him to something better than he has yet experienced, on its gay summit gilded with sunshine. The labour of the ascent is a delight.

In later eighteenth-century France, the philosopher Condorcet was an optimist’s optimist. Shortly before his death on the guillotine in 1794, he affirmed his faith in the perfectibility of Humanity and of human knowledge. Not only would political freedoms follow for all but eventually endemic poverty would be abolished world-wide.⁷ His optimism was contradicted by his personal fate. But it rested upon an impersonal belief in the beneficent spread of knowledge that would outlast and outshine his own era.

Subsequently, the language of ‘advance’ became sufficiently ingrained in western thought that gradual change was readily associated

with positive outcomes. There were some dissenters. Parson Malthus with his thesis of population overkill was one.⁸ However, he too saw change taking place gradually over successive generations. Charles Darwin was in turn influenced by Malthus, albeit with a different outcome. Indeed, Darwin's hegemonic exposition of evolutionary biology was accepted so quickly (despite opposition from Biblical literalists) because it chimed with prior expectations about slow, cumulative change. Darwin's analysis was generally couched in neutral terminology. Yet even he asserted confidently that 'all corporeal and mental endowments will tend to progress towards perfection'; and that, among human societies, 'progress has been much more general than retrogression'.⁹

Sanguine expectations of this sort have, however, proved hard to sustain in the light of the variegated experiences of the twentieth century, including genocides, world wars, civil wars, and many human-made disasters, including mass famines and environmental degradation.

Current warnings from scientists now escalate the risks to a global level. Adverse climate changes indicate that 'things' are not always getting better - and indeed can be getting cumulatively worse, from the point of view of the planetary survival of animate life. Global warming, furthermore, highlights another feature of great import for humans. It is likely that our species is contributing significantly to the adverse changes

by the emission of greenhouse gasses; *and* is simultaneously failing to change direction even after these facts have been repeatedly publicised.¹⁰

In particular, any easy assumption that Progress can be straightforwardly equated with technological improvements is called into doubt. The harmful carbon emissions come from fossil fuel consumption by cars, aircraft, heavy industries and power-plants,¹¹ which together constitute some of the major achievements of twentieth-century technology. Deforestation for commercial development is another problem, reducing the global mantle of trees which absorb carbon harmlessly. Hence gains from one viewpoint may be losses from another.

All these factors mean that excess Enlightenment optimism should be curbed. However, it is wrong to assume that all eighteenth-century thought was blind to life's problems. Voltaire's *Candide* (1759) remains the *Ur*-text to satirise the Dr Panglosses of this world who believe that '*All is for the best, in the best of all possible worlds*'.¹²

It is equally misleading to assume that an Enlightenment faith in science was (or still is) blind to the downsides of innovations and inventions. Often it has been scientists who have been the first to issue warnings. So it was in the case of global warming, which was first advanced as an academic thesis in 1895 by the Swedish chemist Svante Arrhenius¹³ and analysed with more urgency from the 1980s onwards.¹⁴

Nonetheless, should there be any who still believe in unadulterated Progress, for them it is time to reconsider. History continues to unfold. Yet not always for the best that can be imagined or experienced. As Ogden Nash once wrote wittily: ‘Progress may have been all right once/ but it went on too long’.¹⁵

Secondly: Climate Change does not unhinge History

Does the reality of climate-change change current accounts of History? Not at all.

The study of history normally includes analysing disjunctures, disasters, breaks in patterns, disorders, crises, revolutions, and any and all forms of transformation. For a while in the 1990s there was some vogue for a postmodernist belief that each fragment of time was sundered from the other. That attitude discountenanced all historical narratives, whether progressive or the reverse. However, historians were never really convinced *en masse* by postmodernist thought.¹⁶ Instead, they retain a belief in a coherent Time – within which choppy and discontinuous things can occur, as much as can continuous and regular developments.

Hence a huge literature by experts in many disciplines already analyses global disasters – whether occurring in the natural world (such as earthquakes, volcanos, tsunamis)¹⁷ *or* occurring naturally while *also* being sometimes human-made or human-aggravated (such as famines and epidemics) *or* being purely human-made (such as wars and genocides).¹⁸

All of these feature frequently in historical accounts. Humans live on a turbulent planet, and their own behaviour often contributes further to that turbulence. Nothing could be more historical. Indeed, Corfield argues that disjunctures (macro-change) constitute one of the three core dimensions of history, alongside gradual change (micro-change), which is also well studied, and continuity (which is conceptually the most neglected).¹⁹

In particular, attention has been paid to past periods of climate change. There was a relative lowering of global temperatures between the fifteenth to the nineteenth centuries (the start and end datings are imprecise). And there were peaks and troughs within that - the chilliest times of the 'Little Ice Age' occurring in the late seventeenth century, when Londoners skated on the frozen River Thames in midwinter.²⁰ Again, that information signals that climate change is absolutely intrinsic to history, not somehow separate from it. Thus the current big global era in time is known as the Holocene (from the Greek, meaning ultra-recent). It constitutes the relatively warm inter-glacial period that is still continuing, in which all substantive human development has taken place – starting with the invention of farming; towns; commerce; and literacy.²¹

Another name for this current global era is the Anthropocene (from the Greek root Anthrope = human). This alternative term, circulated by the atmospheric chemist Paul Crutzen, emphasises the gravity of the current situation by turning our meddling species into geological time-

markers.²² However, the chronology of the so-called Anthropocene is debated. Some date it from industrialisation in the later eighteenth century, while others go back to the origins of farming many thousands of years ago.²³ Such haziness suggests that the term, which smacks of species vanity, is somewhat overwrought. There is much about planet Earth that is impervious to human activity. On the other hand, our behaviour is very far from neutral in its environmental impact.

The result of such meditations is not that History as such needs to be recast. Because the implications of global warming are frightening, there is a tendency for people to call for new conceptual paradigms as a portentous way of dramatising the crisis. Environmental apocalypse has already been identified as one such mode of thought.²⁴ Nonetheless, it remains much easier to call for a new mode of thought than it is to produce one.

Rather than discarding historical studies, or rerouting them into another round of theoretical arguments, it is imperative to continue to do what historians already do well. That is, to amass and scrutinise evidence; to formulate and test interpretations in the light of the evidence; and to debate with current and earlier generations of those who have studied the past systematically. The fact that some of those historical interpretations, past and present, are imperfect and contested does not mean that they are useless. They form part of a reservoir. Instead, the study of History is a

mighty engine for formulating and debating knowledge about humans in the world – and, as such, is needed today more than ever.

Thirdly: Taking History beyond the Fragments

Climate change and the need for global action encourage historians to take further the current trends to ‘think globally’ and to ‘think long’. It’s time to look ‘beyond the fragments’.²⁵

A trend for ‘going global’ is already happening. History and current affairs are alike being re-informed by historical geography. In terms of analysing responses to climate change, places which are divided by distance, dissimilar economies, and different experiences may be united by common geo-physical characteristics that put them at special risk. For example, all low-lying territories by the sea are vulnerable to rising sea-levels – and the associated danger of salinated groundwater supplies – whether they are industrialised and densely populated communities like the Netherlands or at the frontier of the crisis, like the nine coral island atolls of Tuvalu in the Pacific. Here one-worldism is not just appropriate but unavoidable.

Responding to climate change also requires that global analysis be undertaken not only via the recently popular in-depth studies but also within long-term frameworks. A return to the Big Picture is being signalled by the as-yet specialist appeal of studies over the very long term – known in the USA as ‘Big History’. This approach embraces the entire

lifespan of the planet. It links physical, geological, climatological, biological, and zoological evolution directly into human anthropology and archaeology.²⁶ And, as studies of Big History tend to offer a somewhat schematic vision of recent centuries post industrialisation, they could do with further input from historians.

One obvious issue to analyse is how people in the past have coped with disasters. For example, Japan has been spurred by its turbulent geo-physical history into becoming a world leader in counter-planning to minimise the impact of seismic turbulence and/or to respond promptly to crises. It has a specialist Society for Natural Disaster Science.²⁷ And it has a stoical people, who share a tradition of communal rallying in the face of adversity – a tradition that is being triply tested in 2011 by earthquake, tsunami, and nuclear leakage.²⁸

Many other examples of global or widespread disasters also repay historical examination. For example, the huge Tambora volcanic eruption in Indonesia in April 1815 (the most substantial in recorded history) and its subsequent lesser eruptions led to global cooling as a result of persistent ash particles in the atmosphere. The effect was exacerbated by its occurrence within a period of low solar activity, known as the Dalton Minimum.²⁹ 1816 became the ‘year without a summer’. When the sun did appear, there were spectacular ash-laden sunsets, as shown in the first

illustration (Fig.1 – see above, p. 2) by Britain's foremost artist of light, J.M.W. Turner.

Yet food production everywhere suffered. There were serious grain shortages, especially in the northern hemisphere, and regional famines, such as in south-west China.³⁰ In general, it was the poorest areas which were hardest hit. For example, in England food supplies went to the cities, where they commanded the highest prices, whilst the impoverished labourers of East Anglia rioted in desperation for lack of bread.³¹ The Tambora effect thus provides a pertinent reminder that disasters may also lead to conflict. When resources are scarce and power is unevenly distributed, as it often is, then disputes are likely to result, unless discontent is forcibly repressed.

However, the Tambora effect does also indicate the continuing complexities in calculating trends in climate change. While there are natural and human-made factors which may increase global warming, there are other natural factors (notably variations in volcanic and solar activity), which may achieve the reverse.

Meditations of that sort clearly do not mean that current warnings should be discounted. There is a danger not just of warming but of runaway global warming, reinforced by feedbacks within the system. That might lead to a situation that is catastrophically irreversible.³² Earth might become a lifeless furnace, like the planet Venus.

Powerful warnings, such as that, are not lightly to be ignored. It is true that humans are often late to be roused to action. First warnings tend to be ignored. And in this case, there are plenty of interested parties who have vested commitments to the *status quo*. On the other hand, humans are known as a problem-solving as well as a problem-creating species.

Measures of mitigation include not only cutting greenhouse emissions and moving to renewable energy, but also novel plans by scientists for carbon capture and storage (CCS). These latter proposals are far from settled techniques; they carry other risks of their own; and they are costly, without obvious sources of financial return.³³ Or there are imaginatively different ideas for recycling carbon into other useable forms. How about converting waste carbon dioxide, by the use of wind-power, into carbon-neutral liquid fuels?³⁴ Or would the production costs and/or the technical challenges be too great to adopt on a mass scale? The web hums with proposals and reports of scientific activity. Hopeful as are such thoughts, there are dangers of over-reliance upon a quick ‘techno-fix’. On the other hand, without some mechanisms of technological change, the impact of global warming will be colossally disastrous, especially for the poorest and less protected peoples of the world. Such a scenario is enough to make even the most sceptical techno-sceptic pause.

Alongside the scientific efforts, there are also political responses, albeit very patchy and tardy in their implementation. These depend upon

national governments and the various agencies of the United Nations. There are problems of coordination and problems of political will. The current Kyoto Protocol (1997), under the auspices of the United Nations, is being implemented only slowly; and has yet to be signed by many significant carbon-emitting nations, including the USA.

Historians are already aware that international cooperation has had at best a chequered history, from the Congress of Vienna (1815) onwards.³⁵ On the other hand, there are countless ways in which global agreements have been slowly accumulating. To name but a few, there are: international copyright laws; international policing arrangements; the Geneva Convention on the treatment of war victims; an International Court of Justice; international sports associations and global competitions; an international space station; international agreement over time zones; internationally agreed dialling codes and communications systems; international shipping agreements, including the international Register of Shipping; an International Air Transport Association; a World Bank; an International Monetary Fund - let alone countless international treaties. Some bodies are controversial (the IMF). Or agreements are imperfectly adopted (the Geneva Convention). But many are standard (time-zones). In addition, there are private organisations which span many, if not all, countries. So there are international professional associations; international scientific projects; international businesses;

international media; international charities; and even (albeit less well documented) international crime.³⁶

Moreover, among the world's estimated 40,000+ non-governmental not-for-profit organisations, there are many environmental action groups. Greenpeace is the most celebrated example. It has its headquarters in Amsterdam as well as offices and activists in many countries.³⁷ Like many other pro-Earth lobby groups, it is prepared to challenge orthodox technologies – and to combat official complacency. Thus there is a body of experience and assessment in promoting a thoughtful environmentalism.³⁸ Remedial action should not be left to scientists and governmental bodies but should be undertaken by individuals, nations and communities as a whole.

All these instances, drawn especially from history over the last two hundred years, indicate that humans have the potential to organise internationally. It is true that generally responses are quicker and better when disasters are immediately pressing and obvious. Yet the big-brained species can also 'think long', when needs must. There is therefore the potential to confront successfully something as major as long-term global warming (whatever its causation). The question really is whether realistic strategies can be devised and implemented fast enough.

Three Concluding Comments

Three final comments follow from the standpoint of a historically-informed relative optimist:

First summary point: the climate-change debates should impel historians into more long-term thinking. If simple narratives of untrammelled Progress are unconvincing, so are counter-claims of ever-deepening environmental gloom. Admittedly, apocalyptic visions do constitute one known historical response to crisis.³⁹ Yet these gloom narratives are unconvincing as a full account of history – and, in campaigning terms, they tend to produce a numbing effect.

A second projection: historians usually eschew detailed predictions and for good reasons. Yet when confronting issues such as global warming, historians like climatologists are making inferences about the future based upon systematic study of the past. Human history reveals the world's predominant species to be notorious both for problem-creating and also for problem-solving. Hence, given that the future will always contain some deep continuities, those qualities can be predicted to last as long as does the species. Given too that the future will also comprise some gradual changes, which are extrapolations from current trends, it is likely that environmental concern and remedial actions will be enhanced. But, given that history simultaneously contains turbulence and tipping points, it remains to be seen whether the Earth is now reaching a point of

macro-change, when things will be substantially transformed (and not necessarily for the better). Even major changes, however, will be mitigated and counter-balanced by continuities and micro-changes, making the final outcome at once comprehensible after the event but unpredictable before it.⁴⁰

Hence the third point: the current position is an urgent one. History is rightly viewed as studying not the ‘dead past’ but a ‘living History’. The planet in some form or other will survive. But will humans? We need that human ingenuity and collaborative effort and lifestyle change right now. Optimists think not blue for gloom but red for hope. Turner’s sunset (Fig.1) signals not a blazing end but a traditional ‘red sky at night, shepherd’s delight’. Voltaire, who warned against excess optimism, also counselled against its inverse. His ultimate advice was to ‘cultivate our garden’. For all humans, that means planet Earth. For individuals, it means cultivating our own patches: applying political pressure for environmental action but simultaneously cultivating our local gardens, even down to the last window-box. Remove concrete; plant trees.

Readers: What do you think? And, as importantly, what will you do?



ENDNOTES

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- ¹ With thanks to Mark Levene and Tony Belton – and to all who attended the seminar at London University’s Institute of Historical Research on 1 April 2011, entitled: ‘Does Climate Change throw a Spanner in the Works of History?’
- ² S. Weart, *The Discovery of Global Warming* (Cambridge, MASS., 2003; 2008).
- ³ Roy Spencer, *The Great Global Warming Blunder: How Mother Nature Fooled the World’s Top Climate Scientists* (New York, 2010).
- ⁴ See e.g. Erik Conway and Naomi Oreskes, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York, 2010); and Clive Hamilton, *Requiem for a Species: Why We Resist the Truth about Climate Change* (2010).
- ⁵ See J.B. Bury, *The Idea of Progress: An Inquiry into its Origin and Growth* (1920); C. Lasch, *The True and Only Heaven: Progress and its Critics* (New York, 1991); R.A. Nisbet, *History of the Idea of Progress* (1980); and David Spadafora, *The Idea of Progress in Eighteenth-Century Britain* (New Haven, 1990).
- ⁶ William Hone (1780-1842), *The Spirit of Despotism* (1795; 5th edn., 1821), p. 70.
- ⁷ Marie Jean Antoine Nicolas de Caritat, marquis de Condorcet (1743-1794), *Sketch for a Historical Picture of the Progress of the Human Mind* (Paris, 1795).
- ⁸ T.R. Malthus (1766-1834), *An Essay on the Principle of Population as it Affects the Future Improvement of Society* (1798; and many later edns).
- ⁹ Charles Darwin (1809-1882), *On the Origin of Species by Means of Natural Selection* (1859), p. 489; and idem, *The Descent of Man and Selection in Relation to Sex* (1871), Vol. 1, pp. 177, 184.
- ¹⁰ Politicians internationally have been grappling with the issue since at least 1997, with the adoption of the Kyoto Protocol and attempts at monitoring its implementation. Public eco-awareness has been boosted by Al Gore’s documentary film *An Inconvenient Truth*, dir. D. Guggenheim, 2006, as well as many urgent publications and websites warning of disaster.
- ¹¹ For power-plant emissions world-wide, see the Carbon Monitoring for Action (CARMA) database, compiled by the Centre for Global Development (CGD).
- ¹² F-M. Arouet, known as Voltaire (1694-1778), *Candide: ou l’optimisme* (Paris, 1759), transl. into English as *Candide: Or, All for the Best* (1759), or *Candide: The Optimist* (1762). Voltaire’s target was an uncritical recycling of Leibniz’s definition of this world as the ‘best of all possible worlds’ because made by God: see Gottfried Leibniz (1646-1716), *Essays on the Goodness of God, the Freedom of Man and the Origin of Evil*, in Eng. transl. (1710).

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- ¹³ For Svante Arrhenius (1859-1927), see E.T. Crawford, *Arrhenius: From Ionic Theory to the Greenhouse Effect* (Uppsala Studies in the History of Science: Uppsala, 1996).
- ¹⁴ The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organisation, with support from the United Nations Environmental Programme.
- ¹⁵ Quotation from Ogden Nash (1902-1971), ‘Come, Come Kerouac’, published in the *New Yorker*, 4 April 1959; and cited in very many variant forms.
- ¹⁶ For these debates, which are now fading in intensity, see K. Jenkins, *Re-Thinking History* (1991); A. Munslow, *The Routledge Companion to Historical Studies* (2000); R.J. Evans, *In Defence of History* (1997); J.O. Appleby, L. Hunt and M. Jacob, *Telling the Truth about History* (New York, 1994); and overviews in G.G. Iggers, *Historiography in the Twentieth Century: From Scientific Objectivity to the Postmodern Challenge* (1997); S. Gunn, *History and Cultural Theory* (2006); and N.J. Wilson, *History in Crisis? Recent Directions in Historiography* (2005).
- ¹⁷ See for example J.Z. de Boer and D.T. Sanders, *Earthquakes in Human History: The Far-Reaching Effects of Seismic Disruptions* (Princeton, 2005).
- ¹⁸ A massive literature focuses upon conflict between humans: see summaries in *Encyclopedia of Wars*, ed. P. Charles and A. Axelrod (New York, 2005), 3 Vols; and *Encyclopedia of Genocide*, ed. I. W. Charny (Santa Barbara, CA., 1999).
- ¹⁹ For History’s three dimensions, defined as trialectics, see P.J. Corfield, *Time and the Shape of History* (2007), pp. 18, 122-3, 211-16, 231, 248-9.
- ²⁰ See variously E. Leroy Ledurie, *Times of Feast, Times of Famine: A History of Climate since the Year 1000*, transl. Barbara Bray (New York, 1971); and Brian Fagan, *The Little Ice Age: How Climate Made History, 1300-1850* (2000).
- ²¹ Neil Roberts, *The Holocene: An Environmental History* (Oxford, 1998).
- ²² J. Zalasiewicz, M. Williams, W. Steffen, and P. Crutzen, ‘The New World of the Anthropocene’, *Environmental Science & Technology*, 44 (2010), pp. 2228–31.
- ²³ For a long view, see W.F. Ruddiman, *Plows, Plagues, and Petroleum: How Humans Took Control of Climate* (Princeton, 2005).
- ²⁴ See the essays in *Future Ethics: Climate Change and Apocalyptic Imagination*, ed. Stefan Skrimshire (2010).
- ²⁵ For this resonant phrase, alluding to E.M. Forster’s motto ‘Only connect: ... Live in fragments no longer’, see S. Rowbotham, L. Segal and H. Wainwright, *Beyond the Fragments: Feminism and the Making of Socialism* (1979); and details of associated 1980 conference in www.esds.ac.uk Economic & Social Data Service, SN 4922: Women, Socialism and Feminism, 1970-1980.

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- ²⁶ See D. Christian, *Maps of Time: An Introduction to Big History* (Berkeley, CA., 2004); I.N. Diakonoff, *The Paths of History*, Cambridge, 1999; Felipe Fernández-Armesto, *Civilisations* (2001); M. de Landa, *A Thousand Years of Non-Linear History* (New York, 1997); Fred Spier, *Big History and the Future of Humanity* (Oxford, 2010); and P.J. Corfield, 'Historians and the Return to the Diachronic', in *New Ways of History: Developments in Historiography*, ed. G. Harlaftis, N. Karapidakis, K. Sbonias and V. Vaiopoulos (2010), pp. 1-32, 187-92, 227-9.
- ²⁷ Its website in English = <http://www.jsnds.org/index.en.html>.
- ²⁸ Japan has also been helped by substantial emergency relief aid from around the world, including sums raised by Japanese students and others living abroad.
- ²⁹ This mini-period from c.1790 to 1830, associated with lower-than-average global temperatures, was identified by the British meteorologist John Dalton (1766-1844), after whom it is named.
- ³⁰ See variously *The Year without a Summer? World Climate in 1816*, ed. C.R. Harington (Ottawa, 1992); and Clive Oppenheimer, 'Climatic, Environmental and Human Consequences of the Largest Known Historic Eruption: Tambora Volcano (Indonesia), 1815', *Progress in Physical Geography*, 27 (2003), pp. 230-59.
- ³¹ A.J. Peacock, *Bread or Blood: The Agrarian Riots in East Anglia, 1816* (1965).
- ³² James E. Hansen, *Storms of my Grandchildren: The Truth about the Coming Climate Catastrophe and our Last Chance to Save Humanity* (2009).
- ³³ See variously *Environmental Challenges and Greenhouse Gas Control for Fossil Fuel Utilisation in the Twenty-First Century*, ed. M.M. Maroto-Valer, C. Song and Y. Soong (New York, 2002); *Carbon Capture and Sequestration: Integrating Technology, Monitoring and Regulation*, ed. E.J. Wilson and David Gerard (2007); Simon Shackley and Clair Gough, *Carbon Capture and its Storage: An Integrated Assessment* (Aldershot, 2006); and J.J. Romm, *Straight Up: America's Fiercest Climate Blogger takes on the Status Quo Media, Politicians, and Clean Energy Solutions* (Washington, DC., 2010).
- ³⁴ See David Doty's plans for wind-fuels in www.dotyenergy.com. But it is currently hard to find on the web critical assessments of his proposals.
- ³⁵ Zeev Maoz, *Networks of Nations: The Evolution, Structure and Impact of International Networks, 1816-2001* (Cambridge, 2011).
- ³⁶ But for this latter theme, see variously *International Crime and Justice*, ed. M. Natarajan (Cambridge, 2011); Federico Varese, *Mafias on the Move: How Organised Crime Conquers New Territories* (Princeton, 2011); Frank G. Madsen, *Transnational Organised Crime* (2009); and J. Morton, *Gangland International: An Informal History of the Mafia and Other Mobs in the Twentieth Century* (New York, 1998).

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- ³⁷ For a testimony, with a hyperbolic and somewhat premature title, see Rex Weyler, *Greenpeace: An Insider's Account - How a Group of Journalists, Ecologists and Visionaries Changed the World* (2004).
- ³⁸ Consult the differing responses within *Surviving Climate Change: The Struggle to Avert Global Catastrophe*, ed. David Cromwell and Mark Levene (2007); *Rethinking Environmental History: World-System History and Global Environmental Change*, ed. Alf Hornborg, J.R. McNeill and Joan Martinez-Alier (Lanham, MD, 2007); *Questioning Collapse: Human Resilience, Ecological Vulnerability, and the Aftermath of Empire*, ed. Patricia A. McAnany and Norman Yoffee (Cambridge, 2010); and *History at the End of the World? History, Climate Change and the Possibility of Closure*, ed. M. Levene, R. Johnson, and P. Roberts (Penrith, 2010).
- ³⁹ Eugen Weber, *Apocalypses: Prophecies, Cults and Millennial Beliefs through the Ages* (Toronto, 1999).
- ⁴⁰ Corfield, *Time and the Shape of History*, p. 220.

