The Conquering of Climate: discourses of fear and their dissolution

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Submitted to *The Geographical Journal,* 24 July 2007

Revised: 13 November 2007

Abstract

We are living in a climate of fear about our future climate. The language of the public discourse around global warming routinely uses a repertoire which includes words such as 'catastrophe', 'terror', 'danger', 'extinction' and 'collapse'. To help make sense of this phenomenon the story of the complex relationships between climates and cultures in different times and in different places is in urgent need of telling. If we can understand from the past something of this complex interweaving of our ideas of climate with their physical and cultural settings we may be better placed to prepare for different configurations of this relationship in the future.

This paper examines two earlier European discourses of fear associated with climate – one from the early-modern era (climate as judgement) and one from the modern era (climate as pathology) – and traces the ways in which these discourses formed and dissolved within a specific cultural matrix. The contemporary discourse of fear about future climate change (climate as catastrophe) is summarised and some ways in which this discourse, too, might be dissolved are examined. Conventional attempts at conquering the climatic future all rely, implicitly or explicitly, upon ideas of control and mastery, whether of the planet, of global governance or of individual and collective behaviour. These attempts at 'engineering' future climate seem a degree utopian and brash.

Understanding the cultural dimensions of climate discourses offers a different way of thinking about how we navigate the climatic future. However our contemporary climatic fears have emerged – as linked, for example, to neo-liberal globalism, to ecological modernisation and the emergence of a risk society, or to a deeper instinctive human anxiety about the future - they will in the end be dissipated, re-configured or transformed as a function of cultural change.

Keywords climate, culture, discourse, global warming, fears

Introduction

"If we can conquer climate, the whole world will become stronger and nobler."
[Huntington, 1915:294]

"The possibilities of deliberately bringing about counterveiling climatic changes … need to be thoroughly explored."
[President's Science Advisory Council, 1965]

"Curtailing climate change must … become the project we put before all others. If we fail in this task, we fail in everything else."
[Monbiot, 2006:15]

Climate and Culture

Climate has always carried a precarious and ambiguous meaning for humans. Our physical evolution was forged through amplitudes of climate change - through dangerous encounters with climate - unknown to modern humans, while our cultural evolution has involved a variety of ways of mythologizing and taming the out-workings of Nature's climate. The trail of the flood-myth, for example, can be traced through many early cultures, most notably in the mono-theistic tradition of the Biblical Flood of Judaism, Christianity and Islam. The intimacy of relationship between culture and climate is nowhere better illustrated than in the case of Egypt and the Nile. The climatic pulsing of the river through annual and seven-yearly cycles gave – and still gives - life, sustenance, shape and meaning to Nilotic cultures. The earliest attempts at climatic classification by Herodotus (5th century BC) and Ptolemy (2nd century AD) also revealed the precariousness of our relationship with climate. Whilst the Greeks inhabited the forgiving temperate zone of the eastern Mediterranean, the frigid and torrid 'klima' of the North and the South were realms which gifted the legacy of danger, or even death.

Climate also yields tangible, material, yet unpredictable, benefits for all human cultures. The unpredictability of these benefits is a powerful driver of human innovation, since new technologies, practises and systems are created to build social resilience in the face of a capricious climate (Haberle & Lusty, 2000; Tainter, 2000). On the other hand, the variability of climate has also been invoked to help explain the collapse of civilisations (e.g. Diamond, 2005; Costanza et al., 2007). Yet we now know that humans can accommodate a much greater range of the available climatic space than the Greeks and early Medievals supposed. Sophisticated human

civilisations can be sustained in climates as dramatically different as that of 'torrid' Saudi Arabia (mean annual temperature 24ºC) and 'frigid' Iceland (2ºC).

But climate also interacts with the human psyche and with cultural practice in less material and more imaginative ways. Climate is frequently bound up in notions of personal or national identity (Golinski, 2007) and in the idea of social memory (McIntosh et al., 2000), while climatic fluctuations are adopted as anchors for personal memory in both industrialised (Harley, 2003) and traditional societies (Orlove, 2003). The human experience of climate releases powerful emotions which can be both benign (e.g. inducing both positive and negative emotions; Meze-Hausken, 2007) and threatening (e.g. correlations between climatic parameters and suicide rates; Deisenhammer, 2003). Brönnimann (2002) illustrates this ambiguity when he demonstrates the persistent use of glaciers and palm trees as visual icons of climate change, acting as signifiers of danger – ice sheets, deserts - or as emblems of an Edenic paradise – lush vegetation. Existing throughout the human experience of realised climate, and in anticipation of portended climates, runs a thread of anxiety or fear.

Climate Change Discourses

Cultural discourses around climate *change* also have a history, a genealogy that can be traced (von Storch and Stehr, 2006). Aristotle's student Theophrastus, in the 3rd century BC, observed local changes in climate induced by human agency (Glacken, 1967), while a later Greek discourse of climate change was constructed around experiencing changes in climate through mobility – for example, Mediterranean travellers turning black at the Equator (Boia, 2005). Early modern discourses were constructed around settler communities and deforestation inducing deterioration in regional climate through desiccation (Thompson, 1981). One dominant Victorian discourse - acclimatisation - also centred around changes in climate experienced through mobility, in this case through migration and imperial expansion (Livingstone, 1999). The post-nineteenth century discourse about anthropogenic global climate change driven by changes in greenhouse gases has moved through various phases. Its early emergence through the work of Svante Arrhenius in the 1900s and Guy Callandar in the 1930s was generally associated with positive or benign consequences for society. This contrasts strongly with the dominant tone of the current discourse around such climate change which is one of danger and catastrophe (Lovelock, 2006;

Risbey, 2008) and whose origins Killingworth and Palmer (1996) – using the label of 'apocalyptic' - have traced back to the environmental awakening of the early 1960s.

This latter climate discourse of fear, constructed around looming and apocalyptic changes in future climate, therefore finds resonance throughout the past. Human cultures have always been capable of constructing narratives of fear around their direct or vicarious experience of 'strange', unknown or portended climates … '*The history of humanity is characterised by an endemic anxiety … it is as if something or someone is remorselessly trying to sabotage the world's driving force – and particularly its climate*.' [Boia, 2005:149]. Yet these discourses are always situated – geographically, historically and culturally. They are not imposed by nature, they are created through culture. Neither do they endure. They form, transform and dissolve. Sometimes they return in a different wrapping. They are unstable.

Purpose and Approach

This paper suggests that to understand the present post-modern anxiety about climate change (Ross, 1991; Glover, 2006) we need a deeper cultural and historical reading of climate and its meaning for human society (e.g. Rayner & Malone, 1998) than is usually offered by scientific assessments such as the Intergovernmental Panel on Climate Change (IPCC). It also suggests we need to appreciate the fragility and transience of environmental discourses. I adopt the definition of Dryzek (1997:8) in which a discourse is … *"… a shared way of apprehending the world. Embedded in language it enables subscribers to interpret bits of information and put them together into coherent stories or accounts. Each discourse rests on assumptions, judgements and contentions that provide the basic terms for analysis, debates, agreements and disagreements …"*. Dryzek (1997) elaborates four dominant environmental discourses in the modern era - survivalism, sustainability, environmental problem-solving and green radicalism. In this paper, I take a longer viewpoint and suggest that it is possible to take the essence of Killingworth and Palmer's (1996) contemporary apocalyptic narrative of ecology, environment and climate change – namely, fear – and connect this with discourses about extreme weather and climate from earlier eras.

By examining three (mostly European) discourses of fear in relation to climate the paper demonstrates ways in which our reading of climate and climate change has been, and continues to be, culturally conditioned and historically situated. These three discourses are selected from, respectively, the pre-modern, modern and post-

modern eras … 'climate as judgement' (a fear of unknown causes), 'climate as pathology' (a fear of unknown places) and 'climate as catastrophe' (a fear of unknown futures).

The main elements of the first two discourses, including the wider cultural contexts in which they arose, are summarised and the way in which these discourses of fear were (partially) dissolved - in a sense how climate was conquered – is suggested. The outlines of the contemporary discourse of 'climate as catastrophe' are then traced, as well as three elements of conventional approaches for defusing of these fearful prospects – mastering future climate through geo-engineering, political engineering or social engineering. The paper concludes by suggesting an alternative way of viewing the climatic future, one which sees the contemporary discourse of fear deeply conditioned by (different readings of) culture and that, consequently, will find its dissolution through (uncontrollable) changes in culture rather than through an engineered mastery of the future.

Climate as Judgement

Experiences of extreme weather have long been interpreted by individuals and cultures as signifiers of divine blessing or judgement (Glacken, 1967; Boia 2005). The relationship between God and climate, especially drought, portrayed in the early Jewish scriptures makes very clear this particular reading of weather extremes, an interpretation of the capriciousness of climate that remained dominant in western Europe through the later Middle Ages and well into the early modern period. (It is still a common frame in many traditional cultures; McIntosh, 2000). The fears evoked by extreme and unprecedented extremes of weather were fuelled by a theological understanding of the relationship between God and Nature. Weather was beyond human understanding or control and was seen as a primary instrument for the exercise of God's expressions of favour or disfavour on morally vulnerable populations. These fears could be augmented by a parallel demonising of the causes that lay behind adverse climatic experiences. Seemingly without rational cause, climate and weather was viewed as the territory within which both divine and satanic influences were at work. This association of climate with fear in the late Middle Ages and early modern periods, through attachments of extremes of weather to divine retribution or demonology, is illustrated with three examples drawn from the sixteenth to eighteenth centuries.

With limited naturalistic understanding of the causes of extremes of weather or of changes in climate, European society in the sixteenth and seventeenth centuries frequently sought explanation for adverse weather as an expression of God's will or as the work of the Devil, the latter often as a result of witchcraft (Behringer, 1999). Whilst the former framing was the most common, Behringer's study of climate change and witch-hunting in central Europe during the early Little Ice Age (c.1500-1650) provides evidence of a discourse which attributed the deterioration in climate to witchcraft. Elements of society held witches directly responsible for the high frequency of damaging climatic anomalies, especially in winter, and it seems likely that witches were on occasions burned as scapegoats for climate change (Pfister & Brazdil, 1999). This practise was only suppressed by the Lutheran Church insisting that God alone, not human beings, was responsible for the weather, a teaching consilient with the dominant pre-Enlightenment mind.

The second example is the Great Storm of 26/27 November 1703 which devastated parts of southern England and which was vividly recorded by Daniel Defoe in his classic account 'The Storm' (Defoe, 1704). In hurricane force winds, 8,000 lives were lost, the original Eddystone lighthouse was destroyed and the ships of the Royal Navy were decimated (Brayne, 2002). The Great Storm occurred during the cusp of the Enlightenment, as scientific empiricism with an adherence to the importance of measurement and observation first emerged across Europe. Nevertheless, the dominant frame of causation for such a fearful experience remained theological, as reflected in these words from Daniel Defoe … *'For we never enquire after God in those Works of Nature which depending on the Course of Things are plain and demonstrative; but where we find Nature defective in her Discovery, where we see Effects but cannot read their causes; there 'tis most just, … to end the rational Enquiry, and resolve it into Speculation: Nature plainly refers us beyond her Self, to the Mighty Hand of Infinite Power, the Author of Nature, and the Original of all Causes … When the sins of a Nation are very great and prevailing, it is God's unusual Method to pronounce destruction on the Nation.'* [Defoe, 1704/2003:11-12]. A national fast day on Wednesday 19 January 1704 to ask for God's forgiveness and blessing on the nation demonstrated the extent to which the idea of divine causation of extreme weather saturated British public culture. The mass public participation in these ceremonies included the attendance of Sir Isaac Newton, Archbishop Tennyson and the Astronomer Royal.

The third example concerns the disruption to European weather caused by the eruption of the Laki volcanic fissure on Iceland in 1783-4 (Highwood & Stevenson, 2003). This example further illuminates the sensibilities of a population to narratives of fear and judgement around the extremes of climate. Severe atmospheric, meteorological and environmental disruption was caused across northern Europe by eight months of volcanic emissions, starting in June 1783. The summer of 1783 was exceedingly warm, while the following winter exceptionally cold. Most notable among these anomalies, and certainly unprecedented in living memory, was what was described at the time as a persistent fog … '*… there existed a constant fog over all Europe … this fog was of a permanent nature; it was dry and the rays of the sun seemed to have little effect towards dissipating it.*' [Benjamin Franklin, 1784; cited in Grattan & Brayshay, 1995:128].

Without any widespread scientific understanding of meteorology at the time, the bewilderment as to the cause of such exceptional phenomena engendered a sense of fear and foreboding in the British population (Grattan and Brayshay, 1995). Contemporary newspaper accounts frequently invoked the divine force that lay behind the episodes of extreme weather experienced during the eight months of 1783-4, for example … '*the women shrieking and crying, were running to hide themselves, the commons fellows fell down on their knees to pray, and the whole town was in the utmost fright and consternation.'* [Exeter Flying Post, 10 July, 1783; cited in Grattan & Brayshay, 1995:130]. The Final Day of Judgement was imminent.

During the centuries leading up to 1800, extremes of weather and climate undoubtedly had the power to induce fear within European populations. The lack of naturalistic explanations for experiences of weather that lay outside normal expectation created a sense of anxiety and foreboding which was diffused, or made sense of, only by interpreting such experiences as expressions of divine or satanic will. These interpretations were usually associated with implied judgements on morally lax behaviour or else on occasions, and in the earlier part of the period, with demonological interventions invoked by the human agency of witches. This dominant world view created powerful and binding narratives about the performance of a wayward climate which contributed to psychological and spiritual survival even as all around might be physically threatened.

The weakening of this dominant way of framing climatic disaster was already in evidence by the late eighteenth century. Alongside theological explanations of the

Laki fog there also appeared attempts to apply naturalistic explanations to the unusual climate experienced during that year, for example by Benjamin Franklin (Grattan & Brayshay, 1995). This reflected the increasing 'domestication' of climate during the eighteenth century (Rayner, 2003), which resulted from the more widespread formalised and standardised meteorological measurements of the period (Golinksi, 2003), and the greater penetration into the European social mind of a putative separation between causality due to the laws of God and causality due to the laws of Nature. As climate became enumerated through measurement, and as causation became naturalised, the Enlightened mind first bracketed God, then re-situated him in the purely private sphere (Latour, 1993).

Climate was conquered, or at least tamed, metaphorically through adopting naturalistic explanations of weather phenomenon. By the middle of the nineteenth century the professionalisation of meteorology as a science and the emergence of the first daily weather forecasts (Anderson, 2005) had weakened this theological narrative of fear and judgement around the experience of climate (Jankovic, 2006). Yet traces of this narrative remained, as in later vigorous Victorian disputes about the relevance and efficacy of prayer for stopping or starting rain (Turner, 1974). And hollowed-out theological orientations towards explanations of extreme weather can still be found today, whether in the linguistic convenience of 'Acts of God' for the insurance industry or in the theological repertoire ('sin', 'guilt', 'penance') of contemporary discourse around individual carbon footprints and climate change[i].

Climate as Pathology

The sustained European encounter with the tropics started in the sixteenth century and grew steadily during the imperial adventures of the nineteenth century. The experience of climates novel to Europeans was central to this encounter. Whilst these experiences laid to rest the classical fears of the torrid zone inducing human mutations, a new climatic pathology – a sense of the abnormal – was substituted. This pathology has been most clearly articulated using the lens of Victorian Britain and Empire by the cultural geographer David Livingstone in a series of articles over the last 20 years. Livingstone argues that the novel tropical climates encountered through European exploration and settlement, exactly because of their novelty and 'otherness', took on pathological form (Livingstone 1987; 1999; 2002a,b). Attachments of fear, danger and foreboding to these climates easily followed,

sentiments which had both physical and moral dimensions. In contrast to earlier pre-Enlightenment narratives of fear about climate which arose from unknown causes, this new mentality was promoted through a fear of unknown climatic places.

But the nineteenth century imperial discourse of climate as pathology wove together many earlier ideological and philosophical strands; it did not simply arise through the immediate colonial encounter with the physical climates of the tropics. The lingering climatic determinism of the Greeks was easily recast as racist ideology, echoing Hippocratus from the 4th century BC and the early Enlightenment thinkers of Montesquieu, Kant and Hegel, each of whom casually associated the languid and humid climates of the equator with a moral and mental torpor amongst the native races (Livingstone, 2002a). It was out of this long tradition of attaching racial hierarchies to climate that Ellsworth Huntington's classic study 'Civilisation and climate' (1915) was written and which provided the quasi-scientific evidence base for statements such as … '*We know that the denizens of the torrid zone are slow and backward, and we almost universally agree that this is connected with the damp, steady heat…*' [Huntington, 1915:2], 'knowledge' which had infused nineteenth century imperial discourse.

Descriptions of tropical climates became the carrier not just for racial ideology, but for prevailing notions of general moral and social superiority. Thus the early climate classification developed by Humboldt in the nineteenth century and refined by Köppen early in the twentieth century, was paralleled by a Victorian moral classification of climate. Temperate climates were categorised as 'bracing' and 'invigorating' and tropical climates as 'lethargic' and 'debilitating' (Livingstone, 2002a). Stronger pejorative vocabulary was also introduced. Tropical climates were frequently described as being 'dangerous' and 'deceptive' (McKee, 2002:53,151) and as presenting 'great risk to life' (Hooker and Thomson, 1855:144)

This classification of tropical climates as dangerous and threatening was tightly bound up in the discourse around acclimatisation – could white Europeans settle, survive and rule in 'hostile' climates? (Livingstone, 1999). For example, it was widely regarded that sustainable colonization of India by Europeans required periodic escape by the settlers to the cooler climates of the Indian hills, driving the construction of hill stations as white enclaves (Harrison, 1999). Here again, the association of (tropical) climate with fear, danger and anxiety was as much a function of the imperial ideology of the day as it was a function of detached physical or

medical diagnosis. Opinion became polarised in the later Victorian period about whether or not the unknown and forbidding climates of the tropics were to be feared, and thus were in need of 'conquering' (Sambon, 1897). Whether or not climate was dangerous was a function of one's imperial outlook and one's belief in the physical, mental and moral superiority of the settler race over the indigenous inhabitants.

The moralisation of tropical climate also extended its reach in other, more literal ways. As shown by Livingstone (1999) in his dissection of the writings of Dr Luigi Sambon (1865-1931), the pathology of tropical climate directly connected with the sexual mores of the age … '*Personal habits are of the utmost importance; temperance and morality are powerful weapons in the struggle for life … sexual immorality under the influence of a tropical climate, and in the presence of a native servile and morally undeveloped population, raises to a climax unknown amid the restraints of home life, and becomes one of the most potent causes of physical prostration.*' [Sambon, 1897:66].

Danger therefore surrounded the Victorian conception of tropical climates. Whether due to degeneracy, depravity or debility, the encounter with the unknown climates of south Asia, Africa and South America by white settlers invoked fears and anxieties about climate - and demanded the language of moral categorisation - that emerged from the imperial ideology of the time. As with the pre-Enlightenment discourse of climate as judgement, climate again took on the role ascribed to it by the prevailing and dominant culture.

As the European imperial adventure lost its way in the twentieth century, and as new ways of understanding race, physiology and morality gained ground, the psychological hold on the European mind of the pathology of tropical climates was dissipated. Climate was again conquered, although here in literal senses as well as metaphorical ones. Thus improvements in tropical medicine and air-conditioning technologies removed some of the direct physical fears tropical climates presented to non-indigenous populations, an outcome foreshadowed by Huntington in 1915 using the idiom of the era … '*in the future we can scarcely doubt that this method of overcoming the evil effects of a tropical climate will be resorted to on a vast scale, not only by foreigners, but by the more intelligent portion of the natives.*' [Huntington, 1915:291].

Yet traces of this pathology, of this implicit hierarchy of climates, remain today in Western culture, traces which might still have a weakened lineage back to the

determinism of Huntington, Kant and the Greeks. Faint echoes of this can be found in some of the synthesised judgements of the Intergovernmental Panel on Climate Change (IPCC) assessments. For example, in the reporting of Working Group 2 of the IPCC's Fourth Assessment Report attention was highlighted on the differentiation in the consequences of climate change linked to geography … "*Climate takes aim: attention is now turning to the developing world, where those last equipped to handle it will bear the brunt of global warming … One of the cruel ironies is that among the few set to gain … from agricultural benefits conferred by global warming are those* [developed nations] *with the highest greenhouse-gas emissions.*" [Hopkin, 2007:706-707]. The prospective climates of the tropics, and of the developing world in general, are once again envisaged to be deliverers of danger and death, although not this time for European settler races but for the indigenous inhabitants. Most of the claimed 'millions at risk' from future climate change in the Parry et al. (2001) study are located in these regions.

Climate as Catastrophe

This brings us to an examination of our third discourse of fear and danger surrounding climate – the increasingly dominant portrayal of anthropogenic global climate change, or its avatar 'global warming', as global catastrophe.

The early identification of the prospective human warming of global climate through releases of greenhouse gases into the atmosphere was rarely viewed as dangerous but, predominantly, as benign or beneficial. Thus Arrhenius writing in 1906 was able to state that global warming would allow future populations '… *to enjoy ages with more equable and better climates, especially as regards the colder regions of the earth, ages when the earth will bring forth much more abundant crops than at present for the benefit of rapidly propagating mankind.*' [Arrhenius, 1908:61-63]. Similarly, Guy Callendar in his classic 1938 paper which first associated a global warming trend with rising carbon dioxide levels claimed that '… *the warming is likely to prove beneficial to mankind in several ways; besides the provision of heat and power … it would allow for greater agricultural production and indefinitely delay the return of the deadly glaciers.*' [Callendar, 1938]. And in the early 1950s, popular magazine interpretations of putative global warming were able to caricature the social and environmental impacts through jocular cartoons in which Russian

farmers enjoyed new agricultural opportunity and American workers basked lazily in benign warmth (Baxter, 1953; cited in Fleming, 1998:120).

One of the first associations of anthropogenic climate warming with notions of significant 'danger' was in a 1963 conference of scientists convened by the Conservation Foundation of New York which warned of a '*potentially dangerous atmospheric increase of carbon dioxide*' (cited in Weart, 1997:353). Yet the science claims about prospective global warming were still forming through the 1970s and the early 1980s, and remained ambiguous throughout this period (Fleming, 1998). Concerns about 'dangerous' warmer climates were diluted by some rather tentative and mild expressions of the social risks of climate warming emerging from parts of the scientific community - thus *"... some of the effects of a global warming (caused by CO_2 increases or for any other reason) may well be beneficial."* [Wigley *et al*., 1980:21] – and by a parallel discourse of fear around global cooling. For example, Gordon Rattray Taylor's book 'The Doomsday Book: can the world survive' (Taylor, 1971) contrasted 'ice age' with 'heat death', *Newsweek* magazine cited the ominous signs of a cooling in the world's weather and an impending 'drastic decline in food production' (Newsweek, 1975) and Nigel Calder asked 'Are we heading for an ice age?' in the *Sunday Telegraph Magazine* (Calder, 1979). The imagined cataclysm of the 'nuclear winter' scenario (Crutzen & Birks, 1982) in the early 1980s also stayed the hand of the warming catastrophists for a while longer.

By the mid-to-late 1980s, however, the dominant scientific opinion had settled firmly on the prognosis of future warming[ii] (e.g. Bolin *et al*., 1986) and the emergence of anthropogenic global climate change as a public policy issue around this time induced a heightening of anxiety. Weingart *et al.* (2000) showed that the term 'climate catastrophe' first appeared in the German language in the cultural magazine *Der Spiegel* in April 1986 and they trace the subsequent emergence of this discourse of impending climatic disaster. Following the 'greenhouse summer of 1988' in the USA (Ungar, 1992) and the collapse of the Soviet Union in 1989, fears of Cold War destruction were displaced around the turn of the decade by those associated with climate change - '*… apocalyptic fears about widespread droughts and melting ice caps have displaced the nuclear threat as the dominant feared meteorological disaster…"* [Ross, 1991:8]. And the association of global danger with anthropogenic climate warming was eventually institutionalised in Article 2 of the 1992 UN Framework Convention on Climate Change … '*the ultimate objective of this*

convention is to stabilise concentrations of greenhouse gases at concentrations which would prevent dangerous anthropogenic interference with the climate system.'

Shorter-term cycles of heightened concern and anxiety about anthropogenic climate change have followed over the last 15 years, many of them linked directly to new scientific assessments or to major political negotiating set-pieces (e.g. Boykoff & Boykoff, 2004). Yet the language and metaphorical constructions of fear and catastrophe shaping this discourse have been embellished substantially in the years following 9/11. The 'war on terror' provided a new benchmark against which the dangers of future climate change could be referenced, whilst new linguistic and metaphorical repertoires have been enabled[iii]. "*The alarmist repertoire uses an inflated language, with terms such as 'catastrophe chaos and havoc, and its tone is often urgent. It employs a quasi-religious register of doom, death, judgements, heaven and hell. It also uses language of acceleration, increase, intractaibiltiy, irreversibility and momentum*." [Retallack et al., 2007:55]. These following examples are indicative …

'*The impacts of global warming are such that I have no hesitation in describing it as a 'weapon of mass destruction.''*
[Sir John Houghton, *The Guardian*, 28 July 2003]

'In my view, climate change is the most severe problem that we are facing today--more serious even than the threat of terrorism.'
[Sir David King, *Science*, 9 January 2004]

'*Billions of us will die* [from climate change] *and the few breeding pairs of people that survive will be in the Arctic where the climate remains tolerable by the end of the twenty-first century.'*
[James Lovelock, *The Independent*, 16 January 2006]

'Terror only kills hundreds or thousands of people. Global warming could kill millions. We should have a war on global warming rather than the war on terror.'
[Stephen Hawking, quoted in *The Times*, 31 January 2007:3]

At the same time, enhanced Earth System modelling capabilities have opened up new scenarios of the climatic future, simulating our alleged impending approach to triggering major re-organisations of large-scale functions of the Earth System. The melting of the Greenland Ice Sheet, the massive release of methane hydrates in the tundra, or a re-direction of the thermo-haline circulation of the world's ocean (and attendant changes in the 'Gulf Stream')[iv] are three of the more significant ones. These

prospective futures, given virtual reality through computer modelling, have been grouped together and communicated to an expectant world using Malcolm Gladwell's 'tipping point' metaphor, further nourishing the discourse of global climate catastrophe. Not only does this discourse find saliency in the media (witness examples above), but also through a new cohort of popular science books – for example, Fred Pearce's (2007) book 'With speed and violence: why scientists fear tipping points in climate change' or Mayer Hillman and colleagues' (2007) 'The suicidal planet: how to prevent global climate catastrophe' – and in the more formal academic literature (e.g. Ereaut & Segnit, 2006; Hansen *et al*., 2007; Risbey, 2007).

Dissolving Climate Catastrophe

If the two previous discourses of fear examined here were founded upon unknown causes and unknown places, this contemporary discourse of fear surrounding climate is founded upon the unknown future. The pre-modern and modern fears associated with climate were (largely) conquered, respectively, through rationalisation of the causes of weather extremes and through acclimatisation to tropical climates. Unknown causes became known; unknown places were made safe. These conquerings of climate were not complete - echoes of both of these fears still linger in different cultural forms today – yet they occurred as a by-product of much wider cultural changes involving religion, science, politics and technology.

This naturally poses the question: how will the contemporary discourse of fear about future climate change be conquered, or are we destined to remain living perpetually under the shadow of climate catastrophe? How can we conquer our post-modern fear of the unknown climatic future?

Conquering Climate Through Mastery

A number of prospective routes for conquering climatic change are conventionally held out to us, all of them variants on the idea of 'engineering' – geo-engineering, political engineering and social engineering – and all of them with connotations of global control and mastery of the climatic future[v].

The idea of large-scale deliberate intervention in the functioning of the Earth's climate system to engineer a desirable climate outcome has a long history well explored in Fleming (2006a). He identifies three cycles of promise and hype – of seeking mastery over the climate – starting in the nineteenth century and culminating

in the ideas of geo-engineering our way out of global warming mooted in recent years (e.g. Morton, 2007). Various schemes have been proposed – for example fertilising the southern oceans to enhance carbon uptake, deflector mirrors in orbit around the Earth, aerosol emissions into the stratosphere - and some even evaluated formally inside climate models (e.g. Crutzen, 2006). All of these schemes carry an element of hubris and … "… *by emphasising the purely technical or economic aspects of strategies of weather and climate control, bypassing understanding and prediction and neglecting the human dimensions … we are in danger of entering a new cycle of discourse saturated with hype, the heirs of an impoverished debate*." [Fleming, 2006a:15].

A second variant of the engineering route out of the discourse of catastrophe involves a systematic attempt to align the institutions of international science, environmental management, governance and diplomacy to find rational alliances of interest which can deliver a global climate regime – what we might call 'geo-political engineering'. This brings together the insights of Earth System scientists and technologists (e.g. the vision outlined by Hall & O'Connell, 2007) with those of political scientists and economists to yield a system which Frank Biermann has labelled 'Earth System Governance' (Biermann, 2007). This vision (implicitly) underpins the structure of the UN Framework Convention on Climate Change, the subsequent Kyoto Protocol, the Stern Review and the new round of international negotiations and diplomacy seeking a new post-2012 global climate change settlement. The framing of climate change as a problem of 'climate stabilisation' is an outcome of this way of thinking (as traced by Boykoff et al., 2007; also Oels, 2005). A successful outcome to this governance project demands a degree of optimism unfounded on the evidence of progress achieved to date.

If geo-political engineering is a top-down route for averting climate catastrophe then it is perhaps complemented by a third engineering route, namely the purposeful manipulation of lifestyles and consumption habits – bottom-up 'social engineering'. Social marketing campaigns (e.g. by Defra in the UK; see Linder, 2006) are attempts to change individual behaviour and social consumption habits in favour of lower carbon emissions. The call for mass participation in global events such as Live Earth (July 2007) is further demonstration of a desire to achieve climatic goals through social engineering. Social movements, such as the international Cities for Climate Protection campaign (Slocum, 2004) and the Stop Climate Chaos

campaign in the UK are also part of these purposeful attempts to defuse climate catastrophe, as is Paul Hawken's book 'Blessed unrest' (Hawken, 2007). The limits to this type of mass social engineering, however, are revealed through work in social and behavioural psychology (see Baron, 2006; Weber, 2006).

Reading Climate Change through Culture

These three caricatures of 'engineering' approaches for defusing the discourse of climate catastrophe – geo-engineering, geo-political engineering, social engineering – all bear the language of control and mastery over climate. This mastery is exercised over, respectively, the planet directly, the institutions of governance or the choices and behaviour of individuals. These approaches suggest that climate is an objective reality to be manipulated through material intervention. They imply an unambiguous separation between Nature and culture. Taken at face value these projects all echo the hubris of Ellsworth Huntington from 1915 – '*If we can conquer climate, the whole world will become stronger and nobler*' [1915:294]. It seems unlikely that any of these global mega-engineering projects will offer the salvation that is sought (Fleming, 2006b).

An alternative way to appreciate our fears about the climatic future, and hence to suggest an un-engineered route out of these fears, is to read climate through culture (e.g. O'Riordan & Jordan, 1999; Golinksi, 2007). The fear of unknown climatic causes was dissolved through Enlightenment rationality and the fear of unknown climatic places was dissolved through the collapse of the Imperial project. If we can read our contemporary discourse of climate catastrophe as embedded in and shaped by contemporary culture might we thus offer the prospect of re-situating these fears about the climatic future as cultures change?

It is perhaps in this direction that Steve Yearley is pointing when he distinguishes between the 'substantivist' position on environmental risks and those who take a symbolic reading of them (Yearley, 2006). The former position would see the fears associated with prospective climate change as material and dominant, whereas the latter would place these fears as symbolic and recessive, situated in a psychological deficit, as we see our intuitive sense of Nature - in this case our sense of natural climate - dissembled. For Yearley, "… *we need to read the cultural message* [of climate change] *for its underlying content.*" [2006:14]. Two such cultural readings most immediately present themselves.

Andrew Ross (1991) was one of the first commentators to put global warming into the context of the globalising tendencies of the post-1980s, tendencies which have recently been caricatured as the 'creative destruction' of neo-liberalism by Harvey (2006). We noted earlier the significance of the collapse of Communism in 1989 for the emergence of the discourse of climate catastrophe – fears were transferred from nuclear apocalypse to climate apocalypse – but Ross extends his analysis further by suggesting that the very construction of the idea of a 'global climate' in the 1980s, one that could be measured and monitored, was contingent upon the wider globalisation movement. "*Instead of feeling the weather as we have felt it historically, as part of a shared local, or even national culture, we are encouraged to think of it globally.*" [Ross, 1991:25]. This interconnectedness between globalisation, ideology and the global environment has also been explored by Dalby (2007) and for him the discourse of global climate catastrophe cannot be understood outside this particular geo-political and cultural setting.

A second cultural reading of contemporary climate change would use the idea of ecological modernisation as introduced by Hajer (1995). For Hajer, anthropogenic global climate change is an emblematic example of a phenomenon constructed through the interaction of three trends - a material change in environmental conditions, a heightened ecological consciousness affecting public values, and the growing institutional managerialism of capitalist economies. For Hajer – as for later commentators from science and technology studies (e.g. Millstone, 2005; Oels, 2005; Demeritt, 2006) – an emerging discourse of climate catastrophe reveals more about the struggle for ascendancy between the institutions of science, government, business and civil society than it does about a physical reality waiting to strike.

The contemporary discourse of climate catastrophe may also be tapping into a deeper and non-negotiable human anxiety about the future, an anxiety which is merely attaching itself at the current time to the portended climates of the future – future climates offered up to society by the predictive claims of science. Science has never before offered such putative knowledge of the far-future, complete with uncertainty ranges, tipping points and probabilities, and so our fragile and nervous human psyche has latched onto such pronouncements with vigour. "*Today our expertise and our worries turn towards the weather because our industrious know-how is acting, perhaps catastrophically, on global nature.*" [Serres, 1995:27]. Climate change provides a conduit, a lightening rod, for materialising our immaterial

angst. Yearley (2006) explores these 'phenomenology of nature' worries as exemplified in Bill McKibbin's classic book 'The end of nature' (McKibbin, 1989) and as more recently articulated in Jules Pretty's series of essays 'The Earth only endures' (Pretty, 2007).

Conclusion

Whichever ways our fears of the climatic future have emerged from the wider cultural settings and trends of the late twentieth and early twenty-first centuries – and all of the above cultural readings of climate change are in need of further exploration (see Hulme, 2008) - it is the argument of this essay that it is only through further cultural change, working on and through material processes, that the contemporary discourse of climatic catastrophe will be dissolved. As the naturalistic causal turn of the nineteenth century dissolved the fear of climate rooted in unknown causes and the technology and hyper-mobility of the twentieth century weakened and defused the fear of unknown climatic spaces, so we will find new cultural movements and new hierarchies of power changing the discourse of fear about unknown climatic futures. Our relationship with climate will change again, whilst attempts at engineering the climate of the future, at conquering climate through mastery of the material world, will yield but minor successes. As Boia (2005) implies, the battles over climate change occur as much in the cultural and individual imagination as in the atmospheric spaces in which physical climates are formed.

So there are other possible cultural readings of climate change, poorly explored in the research literature, which do not connote with fear of catastrophe. Climate change and the unknown future look very different when seen, for example, through the cultural eyes of dryland pastoralists in Africa, South Pacific islanders or the Canadian Inuit (see Strauss & Orlove, 2003); climatic catastrophe may not feature within these frames. And the ideas about the domestication of nature explored by Kareiva et al. (2007) offer another way of reading our relationship with climate, a reading which recognises climate as a hybrid entity emerging inescapably from the reflexive shaping of Nature and culture.

New ideas, ideologies and powers will emerge and shape new discourses of climate, discourses located in the new dominant cultural movements of the future. Alignments between ideologies, technologies and cultural movements can change more rapidly than can the physical climate (Ungar, 1992; Dalby, 2007). There is a

future beyond ecological modernisation. Globalism, neo-liberalism and the 'war on terror' will not be with us for ever. Neither may climate catastrophe, at least in its current constructed form. As Terry Eagleton bluntly puts it, "*It is the hard-nosed pragmatists who behave as though the World Bank and caffe latte will be with us for the next two millennia who are the real dreamers, and those who are open to the as yet unfigurable future who are the true realists.*" [Terry Eagleton, *The Nation*, 13 June 2005]

Through all of this, humanity will retain its precarious and ambiguous relationships with climate, relationships which have a long history and an unknown future. The prediction of future climates will remain tantalisingly out of our grasp, just as the prediction of the path of human cultural development on this planet will remain elusive. Rather than seeking to conquer climate, we should be aiming to celebrate climate and respect it as part of ourselves.

Acknowledgements

The ideas in this paper have benefited from discussions with Suraje Dessai and numerous other colleagues in the Tyndall Centre, as well as with Jim Fleming, Sarah Dry, Sam Randalls and Brigitte Nerlich. Comments from one anonymous referee also led to improvements in the text. David Livingstone is thanked for making available a copy of Gary McKee's PhD thesis.

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[i] There also remain echoes, within organised religion, of a pre-Enlightenment worldview as in pronouncements by Anglican bishops that recent flooding in the UK is a judgement on the greed and immorality of modern society ('Floods are judgement on society, say bishops', *Sunday Telegraph*, 1 July 2007)

[ii] The 1985 Villach Conference, held under the auspicies of WMO, UNEP and ICSU, was crucial in crystalling the dominant scientific opinion about the likely course of anthropogenic climate change, namely global warming (Franz, 1997; Agrawala, 1998).

[iii] This association has also been traced in the linguistic repertoire of other public policy issues such as GM food (Cook et al., 2006) and anti-biotic resistant infections, or 'super-bugs' (Nerlich, in press).

[iv] These were all given great saliency following the February 2005 international conference at Exeter on 'Avoiding dangerous climate change', called for by the British Prime Minister, and lavishly reported in the magazine *New Scientist* (12 February 2005:9-11) using the metaphor of 'sleeping giants' in the Earth system.

[v] The more general case of how science as a whole continues to operate a 'predict and control' paradigm with respect to the Earth system is explored by Narasimhan (2007).