

Weather-Worlds of the Anthropocene and the End of Climate

Professor Mike Hulme

Department of Geography, University of Cambridge, Cambridge CB2 3EN, UK

mh903@cam.ac.uk

Contribution to the collaborative double issue of the journal *Weber* with the Rachel Carson Center, on the theme *Transformations of the Anthropocene*, scheduled for Fall 2018 (Issue 34.1)

Abstract:

This essay asks, and develops a possible answer to, the question: 'What is the future of climate when the possibility of "a climate" is no longer?' I argue that the idea of climate only makes sense when there is a degree of stability in some set of conditions, whether these be atmospheric, economic, political or moral. When everything is changing and no stable condition is possible -- the situation to which the idea of the Anthropocene seeks to give expression -- then the cultural value of climate as a stabilising idea is diminished. People in the future will therefore have to learn to live without the idea of climate. At least learn to live without climate as an idea that brings order and stability to relationships between weather and human culture. Given that all cultures are weathered and that weather is increasingly being cultivated by people, new categories and practices of orientation and guidance than the old re-assuring idea of 'climate' will be needed in the Anthropocene.

Introduction

One mid-October afternoon last year, the mid-day skies over Britain turned an eerie shade of orange, bedimming the atmosphere, altering moods and unsettling the people's sense of normality. #apocalypse started trending on Twitter and newspaper headlines spoke of "Britain's Martian sky" and "The day Britain's sky turned orange". Journalists alluded to times past when 'strange weather events' were regarded as omens of doom but now, they claimed, in 2017 "unusual weather is no longer the sign of doom to come, it is the doom itself"¹.

Interpretations of extreme and unusual weather have always reflected human fears of a world unravelling. People have sought, and continue to seek, comforting explanations of the sky's unusual appearance – explanations that these days tend to be scientific – reassuring them that such apparitions are not portentous of fearful events yet to come. The aforementioned orange sky could therefore be explained as the result of the gale-force winds of the decaying Atlantic hurricane Ophelia entraining Saharan dust particles and dispersing them high above the cloudy atmosphere of Britain. Yet this episode and the public reaction to it spoke of a wider unease about today's climate and whether its supposedly normal and reassuringly patterned behavior can be relied upon any longer. Unusual weather – 'weird weather' in popular parlance – nowadays acts as an allegory for a world disturbed and set loose from stable, comforting and predictable foundations. 'Weird' or 'freakish' weathers are now publicly interrogated to reveal the deeper political, cultural or moral meanings of climate-change. That the weather is no longer perceived as 'normal' is symptomatic of the realisation that humans have irretrievably altered their world, their weather-worlds as much as their altered bodies, cities, ecosystems, landscapes and oceans. Red October skies, and any number of other unsettling atmospheric manifestations, are somehow portentous of the new climates of the Anthropocene, the epoch of humans.

In this essay² I interrogate this phenomenon and argue that there is something indeed changing in the human imagination. Climate is an idea inherited by modernity from the deeper past. It is an idea we have grown up with and to which we have become accustomed. For the most part it has served us well, but perhaps no longer. In the Anthropocene the future of climate is bleak. By this I do not mean that future

¹ Apocalypse now – why orange skies have become the new abnormal
<https://www.newstatesman.com/print/node/310827> *New Statesman*, London, 17 October 2017

² Parts of this essay are an elaboration of arguments first made in Chapter 12, 'The future of climate' in:
Hulme, M. (2016) *Weathered: Cultures of Climate* SAGE, London, 178pp.

weather is necessarily bleak; the weather of the Anthropocene will largely be what we make it to be. Rather, I mean that in the Anthropocene the accustomed psychological function of the idea of climate will disintegrate, irrespective of how the weather actually turns out.

The Idea of Climate

To develop this argument it is first necessary to do some work to understand the idea of climate itself. Climate is an ancient idea, traceable over nearly three millennia of cultural history. Contrary to contemporary scientific definitions of climate as 'a statistical ensemble of 30 years of weather' or 'a generalized description of the state and dynamics of the physical planetary system', I approach climate as "an idea which mediates between the human experience of weather and cultural ways of living that are animated by that experience"³. This idea of climate makes it possible for humans to live culturally with their weather⁴. It transforms the raw perception of a turbulent and untamed atmosphere—and the associated phenomena we call weather—into recognizable and expected patterns of atmospheric behavior and performance. Winter and summer, freeze and thaw cycles, monsoons, heatwave or hurricane seasons, rhythms of drought and flood, El Niño and La Niña ... these are some of the attributes of climates which, around the world, provide a scaffold for human existence and offer the possibility of fruitful human action. Although not fully predictable, these patterned elements of climate enable expectations of normal weather to be constructed. This then allows recognition of the abnormal. To say that today is 'exceptionally warm for the time of year' or that 'we haven't seen much rain this spring' are claims that are only possible because of the normalizing idea of climate. Climate becomes a powerful way of ordering the world.

People living in places develop their sense of climate through lifelong experience of how their weather behaves, often mediated through memorialized artefacts in the landscape or through oral histories. This tacit sense of 'what weather happens here' is established even before people listen to the pronouncements of the forecaster or see the climatic statistics of the scientist. It relies on personal knowledge⁵ before it becomes reified through scientific knowledge. The artist/anthropologist Roni Horn reveals this tacit weather sense-making through her work amongst Icelandic citizens,

³ p.3 in: Hulme, M. (2015) Climate and its changes: a cultural appraisal *GEO: Geography and Environment* 2(1), 1-11 doi: 10.1002/geo2.5

⁴ This is a claim I demonstrate historically and culturally in Hulme, M. (2017) *Weathered: Cultures of Climate* SAGE, London

⁵ Polanyi, M. (1958) *Personal knowledge: towards a post-critical philosophy* University of Chicago Press, Chicago, 464pp.

'*The Weather Reports You*'⁶. Fishers, farmers, town-dwellers, office-workers, young and old alike, are all finely attuned to their local weather. And each, in their different way, offer a personal, cultured account of their climate, confirming the contention of phenomenologist Julien Knebusch that: "... climate refers to a cultural relationship established progressively between human beings and weather"⁷. This is one of the reasons why moving from one region or country to another is a disorienting experience. In coming to terms with unfamiliar weather, migrants experience an *ex-situ* change in their climate—a disruption to their expectations of atmospheric normality—to which they have to accommodate bodily, materially and psychologically⁸.

The idea of climate and its realization in familiar places, built-up over time, offers people a sense of security and stability, a reassurance that the atmosphere's vicissitudes are limited and contained. Our sense of climate assures us that the weather can transgress only so far; there are certain boundaries within which it will, or at least should, remain. For the human imagination the idea of climate, one might say, puts weather in its place. As historian of science Lorraine Daston explains in her essay exploring the boundaries of nature, "... without well-founded expectations [such as climate], the world of causes and promises falls apart"⁹. Or to quote sociologist Nico Stehr, we "trust *in* climate"¹⁰. The idea of climate offers the possibility of a stable psychological life and of meaningful human action in the world. Put simply, climate allows humans to live culturally with their weather.

Making the Weather

Yet this is not quite the whole story. It suggests too clean a separation between weather and people. To understand what is missing we need to shift attention away from the idea of climate for a moment and think more deeply about the weather itself; or, more specifically, to think about the inter-penetration of weather and people.

Human cultures have often thought of the weather as the 'domain of the gods'¹¹. The performance of the atmosphere, unlike that of the land, has traditionally been

⁶ Horn, R. (2007) *Weather reports you* Artangel/Steidl, Göttingen, Germany, 196pp.

⁷ p.246 in: Knebusch, J. (2008) Art and climate (change) perception: outline of a phenomenology of climate change Chapter (pp.242-262) in: *Sustainability: a new frontier for the arts and cultures* (eds.) Kagan, S. & Kirchberg, V., Frankfurt a. Main, Verlag für Akademische Schriften

⁸ Strengers, Y. and Maller, C. (2017) Adapting to 'extreme' weather: mobile practice memories of keeping warm and cool as a climate change adaptation strategy *Environment & Planning (A)*, 49(6), 1432-1450

⁹ p.32 in: Daston, L. (2010) The world in order pp.15-34 in: *Without Nature? A New Condition for Theology* (eds.) Alberston, D. and King, C., Fordham University Press, NY, 469pp.

¹⁰ Stehr, N. (1997) Trust and climate *Climate Research* 8, 163-169

¹¹ Donner, S.E. (2007) Domain of the Gods: an editorial essay *Climatic Change* 85, 231-236

thought of as beyond human reach. The weather is the subject of divine fiat and people are the recipients of both blessings and curses delivered through the skies and they have to make of these gifts of fate what they will. But set against this notion of the weather as immune from human agency is a long history of human actions *altering* the weather, of people in effect 'cultivating' the skies. Human capabilities to shape and re-make their environments have gradually extended from the forests, land and seas so that they now also encompass the atmosphere.

This 'weather cultivation' in the past commonly occurred on micro-scales, modifying local weather through tree-planting or irrigation. It has occurred both inadvertently and advertently. Weather cultivation has been undertaken often modestly and pragmatically but also, on occasions, with hubristic economic or military intent¹². And increasingly it has emerged from human activities operating across larger-scales. These weather modification practices have included, *inter alia*, animal domesticating, forest clearing, swamp draining, dam building, city building, roof-whitening, fire burning, desert irrigating, cannon-firing, cloud seeding, coal burning, and so on. The frequency and scale of these human practices have grown alongside the rise of industrial capitalism and complex institutional structures. It has therefore become less and less possible to claim unthinkingly that all adverse weather is 'an act of God'¹³. Rather than seeing the atmosphere as the domain of the gods, the weather must increasingly be understood as an extension of the human. People and their cultural artefacts and practices become weathered, yes; people continually find new ways of living with their weather and its dangers and bounties. But, conversely, the weather becomes cultivated; it increasingly bears the imprints of human cultural activity often reflecting powerful political, economic and technological interests.

This observation parallels what can be seen on the land when we look carefully. Virtually all ecosystems on the planet, and increasing numbers of species within these systems, are now human-altered. Human-influenced change is ubiquitous across all ecosystems, on all continents and in all biomes. As ecologist Chris Thomas argues in his book *'Inheritors of the Earth'*¹⁴, humans are part of nature and so there can be nothing 'unnatural' about these new ecological worlds being composed. With regard to ecology, he claims, we must embrace a natural dynamism in which humans are fully active. This

¹² See Jim Fleming's account human ambitions for climate control: Fleming, J.R. (2010) *Fixing the sky: the checkered history of weather and climate control* Columbia University Press, NY, 352pp. Also see Chapter 10, 'Re-designing climate' in: Hulme, M. (2016) *Weathered: Cultures of Climate* SAGE, London, 178pp.

¹³ Note the curious asymmetry that beneficial weather is not institutionally inscribed also as 'an act of God'. God is never thanked, only cursed.

¹⁴ Thomas, C.D. (2017) *Inheritors of the Earth: how nature is thriving in an age of extinction* Allen Lane, London, 300pp.

is in contrast to "... the conservation rationale ... [which] is usually stated to be some combination of making the world more natural (which is fallacious) and restoring it to a state that resembles one that existed in the past (which is equally fallacious)"¹⁵. The comparison is clear. Just as it is impossible to re-set the biological world to its original trajectory, so too is it impossible to recover the weather of a humanly uninhabited planet. Just as there can be no natural baseline against which ecosystems can be evaluated normatively, so too are we losing any meaningful sense of natural weather which offers a normative benchmark. And just as human-mediated novel ecosystems are coming into being on the land, so too novel weather assemblages are emerging in the sky. Processes of both ecological and atmospheric modification have long been set in motion by human actions and these cannot be reversed.

This inter-penetration of weather and culture was creatively explored in Olafur Eliasson's massive solar installation, 'The Weather Project', at London's Tate Modern in 2002. In the Tate's public gallery, the Turbine Hall, Eliasson created an artificial sun and carefully manufactured an atmosphere of fake weather in which visitors were invited to 'dwell'. Eliasson was claiming it is not just the ecological world of which humans are co-creators; it is the vaster space of the atmosphere itself which human activities are co-producing¹⁶. What 'The Weather Project' sought to point to in the *confined* atmosphere of the Turbine Hall, namely that humans are unavoidably bound-up in the making and experiencing of weather, is what is happening in the *uncontained* atmosphere of the world at large. Not even the weather remains immune from human touch, even if our designs on the atmosphere are always partial, often inadvertent, mostly poorly directed and frequently unjust. Eliasson is saying that there is no stand-point outside of the weather from which humans can stand and objectively observe, measure or manipulate the atmosphere. The sky is indelibly marked by human hand¹⁷ because we live *inside* the atmosphere and cannot do otherwise. For humans to live culturally with the weather is for the weather to be inescapably altered.

This growing recognition of human-shaped environments on land, sea and sky has given rise to the narrative of the Anthropocene, a proposed new epoch in which humans are active creators of their own surroundings. Human agency has become increasingly significant, if not dominant, across all physical processes and on multiple geographic and temporal scales. Chris Thomas makes this point for ecosystems and species. There can be no return to untouched wilderness; ecosystems and species can only evolve going

¹⁵ Thomas, *ibid* p.240

¹⁶ Hornby, L. (2017) Appropriating the weather: Olafur Eliasson and climate control *Environmental Humanities* 9(1), 60-83

¹⁷ Szerszynski, B. (2010) Reading and writing the weather: climate technics and the moment of responsibility *Theory, Culture & Society*, 27(2/3), 9-30

forwards from the present. We need to recognize this also for weather. There is no possibility of reverting to weather assemblages of the past, purified of human influence. Even if they may not always have been, people are now integrally part of the new weather-worlds that are in-the-making.

Undermining the Cultural Value of Climate

Given that this is so, we can begin to identify the challenges these new weather-worlds of the Anthropocene, and their corollary of novel climates, present us with. These challenges are not merely material: disrupted agricultural practices, inappropriately designed buildings, shifting economic fortunes. They are also cultural and psychological: the stabilizing idea of climate, which tames the arbitrariness of the restless atmosphere, can no longer offer the same assurances. The anchor of a stable climate is dislodged and the human ship is left tossing and turning, disoriented on the open sea. It is this anxiety of an atmosphere becoming unfamiliar that gives rise to the vernacular narratives of climate chaos, weather weirding and a disordering of the natural world. This is the contemporary version of Marx's 'metabolic rift'. These narratives are recognizable in both westernized and traditional cultures. And it seems merely to heighten the anxiety that this disordering can be traced back to human actions.

The historian Dipesh Chakrabarty describes this new predicament in his essay on the politics of climate change:

“A world with freakish weather, more storms, floods, droughts, and frequent extreme weather events cannot be beneficial to the rich who live today or to their descendants who will have to live on a much more unfriendly planet”¹⁸.

The idea of climate acted in the past to banish from the human imagination the possibility of 'freakish weather'. What role now for climate when freakish weather invades our present and haunts our future? The idea of climate only offers psychological benefit when there is a degree of stability in some sub-set of conditions, whether these be atmospheric, economic, political or moral. When everything is changing, not least people's weather-worlds, and no stable condition is possible -- the situation to which the idea of the Anthropocene seeks to give expression -- the cultural value of climate as a stabilising idea is diminished.

One of the central claims of the Anthropocene is that *change* in the material conditions of the planet is now inescapable and perpetual. There is no normal, no set of

¹⁸ p.30 in: Chakrabarty, D. (2017) The politics of climate change is more than the politics of capitalism *Theory, Culture & Society*, 34(2-3), 25-37

conditions to which it is possible to return. This is not only because *natural* processes are continually changing material forms; such has been the case throughout the course of Earth's deep history. It is now also because material forms are increasingly bound-up with *human* processes of discovery, invention and improvisation. In other words, changes in the material world now emerge from the irrepressible human technologies and practices which originate in the cultural imagination and the creative human impulse. Whether it is human bodies, material technologies, urban ecologies or regional climates ... nothing is now merely natural or gifted, other than existence itself.

Climatic change—i.e., change that is defined by the adjective 'climatic'—is losing any meaning as a distinct category. Changes occurring to the weather can no longer be isolated from changes occurring to human economies, technologies, societies and cultures. 'Climate-change' is simply a synecdoche, a short-hand for a manifestation of aggregated changes which are at one and the same time environmental, economic, technological, social and cultural. Drawing upon Timothy Morton's idea of climate-change as 'hyper-object', eco-critic Liz Boulton seeks to capture this sense of being inescapably immersed in a world recursively in the making:

"As though encased as a series of Russian dolls, humanity now finds itself 'in' the problem, not a neutral observer sitting outside it. 'There is no exit' Morton writes, comparing humans situation to waking up and realizing that one has been buried alive"¹⁹.

People of the future will therefore have to learn to live without the idea of climate. At least learn to live without climate as an idea that brings order and stability to relationships between weather and human culture. Order and stability are no longer on offer in the Anthropocene. Weather-worlds are continually in flux and so climate becomes a zombie idea²⁰.

Climate in the Anthropocene

So let me reprise my argument thus far. Climate is an old idea that, for the most part, has served us well. It has offered people a way of navigating between, on the one hand, the human experience of an intensely dynamic atmosphere and the precarious weather it yields with its attendant insecurities and, on the other, the need to live in the world with some expectation of meteorological regularity and stability. Second, however,

¹⁹ p.777 in: Boulton, E. (2016) Climate change as a 'hyperobject': a critical review of Timothy Morton's reframing narrative *WIRES Climate Change* 7(5), 772–785

²⁰ A 'zombie' idea is one which is apparently dead, but which continues to 'live-on' through its intellectual and imaginative legacy. See Beck, U. and Beck-Gernsheim, E. (2001) *Individualization: Institutionalised Individualism and its Social and Political Consequences*. London: Sage.

there has always been a degree of fiction to this idea of climatic stability; there has always been an underlying tension and imaginative unease about the integrity of climate. We have always projected our anxieties onto the weather. As Lucien Boia remarks: "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".²¹ The fact is that people have never been fully separate from their weather and the skies have never solely been the domain of the gods. Increasingly, people have altered their weather-worlds, whether deliberately or accidentally, whether locally or at scale, whether mandated or not. And so, third, the reach of human agency has now so extended into the skies that in a new century, and in a proposed new epoch, this convenient fiction is unmasked and the full consequences now confront us. Climates are changing 'in front of our eyes'²² and the old reassurances offered by the idea of climate no longer hold. Clive Hamilton puts it thus, in the context of the Anthropocene: "The natural world inherited by modernity is gone and all the ideas that built on it now float on its memory"²³.

In the fourth and final stage of my argument I therefore turn to think about the future of climate in the Anthropocene. Given my claim that all human cultures are weathered and that weather is increasingly cultivated, new and more culturally fruitful devices than the old stabilizing idea of 'climate' will be needed to guide us. The idea of the Anthropocene reveals the power humans now have²⁴ of composing the future worlds future generations of humans and non-humans will live with. We may not wish it so; but so it is and it will be a never-ending task. These worlds of manufactured nature consist not only of our bodies, robots, cities, species or ecosystems. They now also extend to the atmosphere and include new weather-worlds that are in-the-making.

These new powers are not a license for any and all forms of weather-cultivation, any more than Thomas's argument about human-altered biological worlds is that all forms of ecosystem novelty or re-wilding, species-making or de-extinction are ethical, wise or desirable. But he is exactly right in claiming that our aspiration cannot be to go backwards with respect to life and biodiversity on the land and in the ocean. Humans are deeply embedded in the evolutionary processes of life-making and these only proceed in one direction. Similarly in the skies. The atmosphere cannot be 'un-made'; its composition and functioning bear our marks and the weather is now and forever of

²¹ p.149 in: Boia,L. (2005) *The weather in the imagination* Reaktion Books, London, 200pp.

²² For the significance of this claim, see: Rudiak-Gould,P. (2013) 'We have seen it with our own eyes': why we disagree about climate change visibility *Weather, Climate & Society* 5(2), 120-132

²³ p.38 in: Hamilton,C. (2017) *Defiant Earth: The Fate of Humans in the Anthropocene* Polity Press, Cambridge

²⁴ Note: this power is not evenly distributed, nor collectively governed.

human-making. It is for good reason that Tim Flannery named his best-selling book about the changes happening to the world's climate *'The Weather Makers'*²⁵.

The significance of this realization is that climate can no longer be thought about imaginatively, nor used normatively, as it was in the past. The idea of climate no longer carries the same reassuring guidance for acting in the world. Whatever the climates of the Holocene--and they were considerably more variable than is often assumed--they can no longer offer a normative guide to the climates of the Anthropocene. There is no baseline to which we can return; the equivalent for the atmosphere of re-wilding ecologies on land is not possible. Rather than being useful as an imaginative way of, first, separating weather *from* culture—physical and social processes which in fact cannot be separated--and, then, of stabilising relationships *between* weather and culture--relationships which in fact cannot be stabilized—the idea of climate is now moot. In the Anthropocene the possibility of such stability is a chimera. Metaphorically speaking, the climate of the Anthropocene can only be climate-less. The state of being in 'a climate' can no longer be attained. It therefore makes no sense to speak of climate, when the imaginative work performed by the idea of climate no longer has traction.

A corollary of this is that the invented notion of 'global-mean temperature' offers a false and dangerous illusion of controllability in the Anthropocene. Global-mean temperature has emerged as the guiding index for putative global climate governance. The limiting of global warming to no more than 2 degrees Celsius, or even 1.5, above the pre-industrial level, is the mantra which is used to regulate economies, technologies and behaviours at all scales. But the climatic abstraction of 'global-mean temperature' has little relationship with the multiple ways in which weather-modification occurs in a multitude of places and through cascades of mostly uncoordinated actions. It is wrong to believe that securing a particular global temperature, even were it to prove possible, is a means to re-secure the climate. One only has to examine the plans of the growing cadre of putative climate engineers to see this. Solar climate engineering seeks to deploy technologies—notably the seeding of the stratosphere with artificial particles to mimic the effect of explosive volcanic eruptions--to regulate the radiative fluxes of the planet. By so doing, it is claimed, global-mean temperature can be stabilized. Yet stratospheric aerosol injection is a brute-force method which, whilst seeking control of global temperature, will have uncontrollable effects on regional and local weather²⁶.

²⁵ Flannery, T. (2006) *The weather makers: our changing climate and what it means for life on earth* Penguin Books, London, UK, 341pp.

²⁶ These arguments are explored in: Hulme, M. (2014) *Can science fix climate change? A case against climate engineering* Polity, Cambridge, UK, 158pp.

Since I am claiming that the 'stable' climate of the Holocene is not recoverable, that the index of global-mean temperature offers a false promise of climatic control and that the very idea of climate is moot, what imaginative resources are we left with to guide weather-shaping practices in the Anthropocene? My suggestion is that we use gardening as a metaphor for thinking about human attitudes towards weather-making in the Anthropocene²⁷. Applying this metaphor to the future of climate moves the emphasis away from impossible ambitions to re-secure climate through modernist projects of control and toward thinking in terms of improvisation, of working with nature to fashion outcomes which are neither fully predictable nor fixed. Holly Buck explains the value of such thinking in relation to the Anthropocene:

"The garden is a site through which we can examine connection and care in practice. It is a powerfully enchanting trope: the linguistic enchantment of the garden of love, the walled garden, the secret garden, and so on. The Anthropocene provokes the question of scale ... large-scale industrial monocropped landscapes are a referent for Anthropocene horror tales; planetary gardening imagines something quite different"²⁸.

Gardeners require virtues of humility, cheerfulness and attentiveness as they go about their work²⁹. Gardens are of course a joint product of human imagination and skill working with and through processes of soil conditioning, photosynthesis and the weather. In her relationship with nature, a gardener is neither in control nor powerless. There is a mutuality in which—at least in the best gardens--human vision and virtuous intention can find expression, alongside a celebration of the freedoms possessed by plants, animal life and soil. The battle against weeds is relentless and without end, but is a battle freely engaged in by the gardener and is pursued resolutely. The focus is as much on the benefits internal to the practice of gardening rather than it is on the outcome itself, or the benefits of the outcome³⁰. Gardening becomes a metaphor for caring and making, mindfully and responsibly.

If we apply this metaphor to the atmosphere then, just as the garden reflects the virtues of the gardener, so we see that the weather-worlds of the Anthropocene will come increasingly to reflect the virtues, or vices, of the *Anthropos*. To an extent greater than ever before, the weather of the Anthropocene will come to reflect the moral standing of humanity. Our moral triumphs and failures on earth--the struggles between

²⁷ Here I draw explicitly on Chapter 12, 'The future of climate' in: Hulme, M. (2016) *Weathered: Cultures of Climate* SAGE, London, 178pp.

²⁸ p.374 in: Buck, H. (2015) On the possibilities of a charming Anthropocene *Annals of the Association of American Geographers* 105(2), 369-377

²⁹ Di Paola, M. (2015) Virtues for the Anthropocene *Environmental Values* 24, 183-207

³⁰ *ibid*

corruption and justice, greed and generosity, ingenuity and ignorance, hubris and humility--will be reflected in the sky. Forrest Clingermann and colleagues illustrate this thinking in terms of the desired character traits of the putative climate engineers³¹. These authors draw upon religious traditions to identify and apply the virtues of responsibility, humility and justice to climate engineering. If practiced, they argue, these virtues will engage ethicists, citizens and faith communities in the design of the work being undertaken.

The metaphor of gardening also highlights a further, somewhat paradoxical, point: the gardener always recognizes the limits to their cultivating and coaxing powers. So too in the skies will we need to recognize the limits of weather cultivation in the Anthropocene. There will always remain a powerful 'otherness' to the weather³². Just as past weather was never fully tamed, whether by supplication to the gods or through the protective idea of a stable climate, neither will future weather be fully domesticated by humans' cultivating powers. To a substantial degree it will always exceed attempts at its cultivation, just as does the soil, the ocean or indeed the human body. Yet, just as we toil on the land and in the ocean and struggle to make them both yield to human needs, wants and values, so too are we now committed to toiling in the sky. Weather in the Anthropocene will forever be in-the-making, an unending activity which will require constant reflection and adjustment. Just like a tended garden.

Cultivating the weather will be a precarious and morally demanding task, one that will require the courage to dispense with the stabilizing idea of climate. But it is a task that now – for good or ill – cannot be shirked.

*** END ***

³¹ Clingermann, F., O'Brien, K.J. and Ackerman, T.P. (2017) Character and religion in climate engineering *Issues in Science and Technology* Fall Issue, 25-28

³² Clark, N. (2011) *Inhuman nature: sociable life on a dynamic planet* SAGE, London, 245pp.