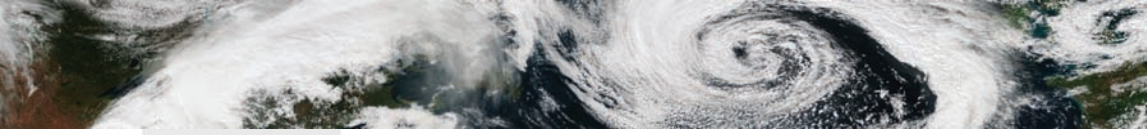


Openings and Retrospectives



BETTER WEATHER?: The Cultivation of the Sky

MIKE HULME
King's College London

What are humans doing to the Earth's atmosphere? Changing it, yes, as was acknowledged in the first international political meeting on climate change, held in Toronto in June 1988, called *The Changing Atmosphere: Implications for Global Security*. But are humans also damaging or destroying the atmosphere, as implied in the 1980s narrative of the depletion of the stratosphere's ozone layer? Are we polluting the atmosphere with excess carbon dioxide or, as some would have it, fertilizing the atmosphere with an essential plant nutrient? And when considering the objectives of climate policy, what metaphors are used to describe the project: Is the Earth's climate being controlled, enhanced, protected, preserved, or restored?

In an essay written a decade ago, the environmental theologian [Willis Jenkins \(2005\)](#) argued that it is important to pay careful attention not simply to metaphors used to describe *nature*. Scrutiny is equally important of metaphors used to describe *human agency* with regard to the natural world. Writing from an environmental ethics perspective, he offered two guiding criteria for evaluating metaphors of agency. Well-chosen metaphors should, first, capture the complexity of there

being various degrees of the natural and the artificial, and, second, they should accommodate a productive role for human interventions while remaining alert to the degenerative potential of such actions. Thus perfecting or caring for nature would, he argued, win out over preserving or managing.

So what are humans doing to the Earth's atmosphere and hence to the weather that it yields? Are we cultivating or polluting the atmosphere, enhancing or destroying, caring or abandoning, conserving or depleting it? In this essay I want to use the specific metaphor of cultivation—which I think meets Jenkins's two criteria—to reflect on the human relationship with the atmosphere and its weather. After all, humans quite happily cultivate the land and ocean; why should they not cultivate the sky? Human cultivating practices throughout countless generations have yielded agricultures, horticultures, aquacultures, silvicultures, and permacultures. Is it fruitful, is it possible even, to think in terms of weathercultures? What weather might humans be cultivating?

THE TROUBLE WITH WEATHER

To start this brief investigation, we must think some more about weather. Humans have always had a problem with their weather—the fruit of the sky. Weather never quite performs to desire or expectation. It is constantly in flux; weather is always both passing away and in renewal. It brings blessing and danger, offers comfort and fear. Weather can lay the conditions for both life and death. It is always unruly and yet in some way, as the atmosphere moves through the seasons, also regular. Given this otherness about the weather, its importance for human well-being yet its uncontrollability, it seems unsurprising that the sky became an obvious home for the gods—the gods of thunder, lightning, rain, and wind. Supplications were, and still are, made to these gods, and to others also, entreating them to bring benign or beneficent weather, to show mercy on crops, homes, rivers, and seas. Many ancient mythologies or religions viewed the sky as “the domain of the gods” (Donner 2007).

Similar animistic sentiments have been held in relation to forests, oceans, swamps, deserts, and mountains, all of which have been for many—and remain for some—the dwelling place of the gods. But through practices of human cultivation over many generations, these other spirit-dwelling domains have become disenchanting and naturalized. Forests and the ocean deeps are no longer feared, but felled and fished; swamps are drained, deserts irrigated, mountains conquered. Landscapes have become cultivated.

But while this has not happened in quite the same way with the sky, I want to suggest that the idea of climate has in a different way marked an attempt to cultivate the atmosphere (cf. [Hulme forthcoming](#)). The idea of climate introduces a sense of stability or normality into what would otherwise be for humans too chaotic and disturbing an experience of unruly and unpredictable weather. Although the weather often fails to meet human expectations, the fact that we *do have* expectations derives from the idea of climate: “Climate is the ordinary man’s [*sic*] expectation of weather . . . there is a limit to the indignities that the weather can put upon him, and he can predict what clothes he will need for each month of the year” ([Hare 1966](#), 99–100). As a normalizing idea, climate offers humans some sense of security. It allows us to put weather in its place, so to speak. Or as [Lorraine Daston \(2010, 32\)](#) explains in her essay exploring the boundaries of nature, “without well-founded expectations, the world of causes and promises falls apart.”

Climate serves such a purpose and so should be understood as performing important psychological and cultural functions. Climate offers a way of navigating between the human experience of a constantly changing atmosphere with its attendant insecurities and the need to live with a sense of stability and regularity. Humans look to the idea of climate to offer an ordered container—a linguistic, sensory, or numerical repertoire—through which to tame and interpret the unsettling arbitrariness of the restless weather. This container creates Daston’s necessary orderliness. Climate may be defined according to the aggregated statistics of weather in places or as a scientific description of an interacting physical system. Climate may also be apprehended more intuitively, as a tacit idea held in the human mind or in the social memory of what the weather of a place should be at a certain time of year. But however defined, formally or tacitly, it is our sense of climate that establishes certain expectations about the atmosphere’s performance. The idea of climate enables the possibility of a stable psychological life and of meaningful human action in the world. Put simply, the idea of climate allows humans to live culturally with their weather. As with other cultivational practices, the stabilizing idea of climate has developed, produced, and even, in some sense, improved the weather by giving it cultural meaning.

In following this line of thinking, the trouble with weather thus emerges as threefold. First, our gods have abandoned us—or rather, many of us have largely abandoned our gods. We have stopped believing in anyone wiser or more benevolent than ourselves. Our fates are left to the inanimate and cold mercy of the skies and the weather it leaves us with. But now this disenchantment of the

skies is compounded—a second unsettling—because the protective defenses we have built using the idea of climate as a stabilizing and ordering scheme have been breached. The past two hundred years of scientific inquiry have shown us that the atmosphere and its weather turn out to be deeply unstable across all time scales (Woodward 2014), much more so than we would like. Ice sheets wax and wane, ocean currents slow and quicken in the deep, volcanoes wreak havoc with the skies, and ocean and atmosphere are coupled in a bewildering variety of rhythms and dances. The idea of a stable climate is a chimera, not least during the recent past of the Holocene, with its little ice ages, mega-droughts, and volcanic winters (Fagan 2004). So after evacuating the atmosphere of the gods, the fictitious idea of climate has failed to pacify and harness the weather to satisfy human ends.

Furthermore, the past fifty years of scientific inquiry have shown us something else about the weather, the third component of our now disturbing condition. These unstable atmospheric conditions are exacerbated by the consequences of cumulative human actions. Through our consumption of energy and our acquisition of food we are changing the flows of energy from sun to surface, from atmosphere to ocean, from land to sky. We now find ourselves in a triple bind. We have abandoned our dependence on the weather gods, and our manufactured idea for bringing order to the weather, namely climate, turns out to be not only illusory—nature is not so easily tamed (Clark 2011)—but also compromised by our own prolific behavior.

PROJECTS OF ATMOSPHERIC CULTIVATION

With this context established, it is possible to reflect on the range of human projects of atmospheric cultivation. By these I mean intentional, but not always sagacious, projects of improvement through which the sky becomes cultivated, that is, the atmosphere bears the imprint of considered human thought, design and action (Szczepanski 2010). Modernity has been alive with projects seeking to cultivate the sky, projects that have aspired to an atmosphere modified in some way so as to yield more desirable weather. I have no space here to give a proper account of these projects, but good summaries of them can be found in the following texts. Thus Richard H. Grove (1995) describes the emergence of projects of the European colonizers that through cultivating the land (e.g., draining swamps, plowing soil, felling forests) in fact sought to cultivate the sky. Fabien Locher and Jean-Baptiste Fressoz (2012) describe political projects of social cultivation that sought indirectly to cultivate the sky through their progressive and

emancipatory goals. And in [James Rodger Fleming \(2010\)](#) one finds a history of projects of great technological ingenuity and sometimes hubris (e.g., diverting rivers, seeding clouds, diverting hurricanes) that sought to cultivate the sky by directly intervening in the atmosphere.



Figure 1. Panel at the 2008 United Nations Climate Conference, from “The Biggest Talking Club in the World: UN Climate Conference Ends Today,” *Greenboard* blog, December 12, 2008. <http://eurotope.ning.com/profiles/blogs/the-biggest-talking-club-in>.

If the above might be regarded as the cultivational projects of modernity—and with limited success in many senses and in most cases—we now in the twenty-first century have to come to terms with a new generation of imagined projects of atmospheric improvement. There is no hiding from the extent to which the atmosphere has been inadvertently altered with the byproducts of industrial processes (e.g., CFCs [chlorofluorocarbons], fossil carbon dioxide, sulphate aerosols) and of land practices (e.g., methane, smoke, aerosol particulates)—inadvertent cultivation one might say, if this is not an oxymoron. And so our anxieties have multiplied. Weather is no longer just wild—humans have always known wild weather—but for some it is now “weird,”¹ while others deem the prospects of further changes frighteningly dangerous ([Schellnhuber et al. 2006](#)).

And so new practices of late modern atmospheric cultivation have been invented to un-weird the weather or to rescue it from its dangerous transgressions. Thus scientists are seriously contemplating, if not researching, stratospheric aerosol injection, injecting particles into the sky to cultivate a more benign climate ([Hulme 2014a](#)), while technologies of carbon dioxide removal are being developed and trialed. These new projects of atmospheric improvement—in fact cultivation, as I am suggesting—are not, as in the case of anthropogenic global

warming, inadvertent. Nor are they piecemeal, as in the earlier works of modernity that sought to cultivate the atmosphere. These new projects aim to be systemic. They aim to recondition the entire atmosphere as one cultivated by humans and reimagined through eco-machinima such as Google Earth (Gurevitch 2014).

CULTIVATORS OF THE SKY?

So what are humans doing to the Earth's atmosphere? Using the metaphor of cultivation through which I have framed this essay, what sort of cultivational aspirations and practices is humanity on the verge of implementing in the atmosphere? Since we recognize that the material reach of human agency now extends to the skies—that is, what we do on and beneath the land has consequences for the weather—our choices must consider this knowledge. In this sense, humans cannot escape being cultivators of the sky in one way or another (Weitzman 2014), and so we need to think critically, ethically, and politically about the implications of this fact.

It seems to me that as a response to the passive human cultivation of the atmosphere in past centuries, two forms of active future cultivation might usefully be distinguished: de-cultivation and re-cultivation. *De-cultivating practices* would be those activities that seek to remove substances from the sky, to put the atmosphere back to what it was. This follows a narrative of purification or naturalization, and the range of putative carbon dioxide removal technologies exemplifies such an aspiration. There are parallels here with the idea of rewilding (e.g., Monbiot 2014) or ecological restoration (e.g., Marris 2011), both of which of course constitute deliberate forms of cultivation. Can the atmosphere be so cultivated as to re-create wild or natural weather, to cleanse the atmosphere of its human additives and return it to some prehuman (or at least less human) condition? There is fruitful work to be done in thinking this through; many of the same challenges and controversies may well face the atmospheric and the ecosystem cultivator.

Re-cultivating practices, on the other hand, would be those activities seeking to add substances to the sky, to remake the atmosphere to be what it can. This follows a narrative of enhancement or improvement, and technologies such as stratospheric aerosol injection exemplify such an aspiration. There are parallels here with the aspiration of human enhancement (e.g., Hauskeller 2013, whose title I borrowed for this essay), again a form of cultivation, but in this case exercised on the human body. As with the atmosphere, humans are changing their

bodies inadvertently through a wide range of sociotechnical practices, and so projects of human enhancement, correction and improvement abound. As these human-enhancement technologies multiply, so too, I believe, will calls for the creation of willfully cultivated, corrected, and enhanced weather (Keith 2013). Similar questions concerning such enhancements may emerge: How benign for the body/weather are such interventions?; How can one distinguish between the enhanced and the unimproved condition? (see Hulme 2014b); and How far do we desire to become masters of ourselves/the skies? Michael Hauskeller's apologetic for the importance of retaining a certain givenness or giftedness about the human body applies equally, it seems to me, with respect to the atmosphere.

I have suggested that the projects of both atmospheric purification and atmospheric enhancement constitute forms of cultivation. They resemble agricultural practices: progressive projects of development and supposed improvement through which new forms of weather will be produced. But though we cannot avoid making choices between the above forms of cultivation—including the option of our continued passive cultivation—we also need to recognize a limit to the cultivating powers of the human. As Nigel Clark (2011) explains in his book *Inhuman Nature*, the weather will always retain a powerful otherness. It will never be tamed by humans' cultivating powers, just as in the past it was never fully tamed by supplications to the gods or through the protective idea of a stable climate.

The weather to a substantial degree will always exceed attempts at its cultivation, just as does the soil, the ocean, or indeed the human body. God's judgement on Adam was that "the ground is cursed because of you. All your life you will struggle to scratch a living from it. It will grow thorns and thistles for you, though you will eat of its grains."² Just as we toil on the land and struggle to make it yield to human needs and wants, so, too, now we are committed to toiling in the sky. Cultivating better weather in the skies above our heads will prove a precarious task, yet a task, I believe, that now—for good or ill—will be never-ending.

ABSTRACT

In this essay I use the metaphor of cultivation to reflect on the developing human relationship with the atmosphere and its weather. I suggest that the putative geo-engineering projects of atmospheric purification and atmospheric enhancement constitute forms of cultivation. They resemble agricultural practices: progressive projects

of development and supposed improvement through which new forms of weather will be produced.

NOTES

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1. For example, Friedman (2010) writes, "I prefer the term 'global weirding', because . . . weather gets weird. The hots are expected to get hotter, the wets wetter, the dries drier and the most violent storms more numerous."
2. Gen. 3:17–18, New International Version.

REFERENCES

- Clark, Nigel
2011 *Inhuman Nature: Sociable Life on a Dynamic Planet*. London: Sage.
- Daston, Lorraine
2010 "The World in Order." In *Without Nature? A New Condition for Theology*, edited by David Alberston and Cabell King, 15–34. New York: Fordham University Press.
- Donner, Simon E.
2007 "Domain of the Gods: An Editorial Essay." *Climatic Change* 85, nos. 3–4: 231–36. <http://dx.doi.org/10.1007/s10584-007-9307-7>.
- Fagan, Brian M.
2004 *The Long Summer: How Climate Changed Civilization*. London: Granta.
- Fleming, James Rodger
2010 *Fixing the Sky: The Checkered History of Weather and Climate Control*. New York: Columbia University Press.
- Friedman, Thomas L.
2010 "Global Weirding is Here." Opinion, *New York Times*, February 17. <http://www.nytimes.com/2010/02/17/opinion/17friedman.html>, accessed September 14, 2014.
- Grove, Richard H.
1995 *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860*. Cambridge: Cambridge University Press.
- Gurevitch, Leon
2014 "The Digital Globe as Climatic Coming Attraction: From Theatrical Release to Theatre of War." *Canadian Journal of Communication* 38, no. 3: 333–56.
- Hare, F. Kenneth
1966 "The Concept of Climate." *Geography* 51, no. 2: 99–110.
- Hauskeller, Michael
2013 *Better Humans? Understanding the Enhancement Project*. Durham: Acumen.
- Hulme, Mike
2014a *Can Science Fix Climate Change? A Case Against Climate Engineering*. Cambridge: Polity.
2014b "Attributing Weather Extremes to 'Climate Change': A Review." *Progress in Physical Geography* 38, no. 4: 499–511. <http://dx.doi.org/10.1177/0309133314538644>.
Forthcoming "Climate and Its Changes: A Cultural Appraisal." *Geo: Geography and Environment*.
- Jenkins, Willis
2005 "Assessing Metaphors of Agency: Intervention, Perfection, and Care as Models

- of Environmental Practice.” *Environmental Ethics* 27, no. 2: 135–54. <http://dx.doi.org/10.5840/enviroethics200527227>.
- Keith, David
 2013 *A Case for Climate Engineering*. Cambridge, Mass.: MIT Press.
- Locher, Fabien, and Jean-Baptiste Fressoz
 2012 “Modernity’s Frail Climate: A Climate History of Environmental Reflexivity.” *Critical Inquiry* 38, no. 3: 579–98. <http://dx.doi.org/10.1086/664552>.
- Marris, Emma
 2011 *Rumbunctious Garden: Saving Nature in a Post-Wild World*. London: Bloomsbury.
- Monbiot, George
 2014 *Feral: Rewilding the Land, Sea, and Human Life*. London: Penguin.
- Schellnhuber, Hans Joachim, Wolfgang Cramer, Nebojsa Nakicenovic, Tom Wigley, and Gary Yohe, eds.
 2006 *Avoiding Dangerous Climate Change*. Cambridge: Cambridge University Press.
- Szerszynski, Bronislaw
 2010 “Reading and Writing the Weather: Climate Technics and the Moment of Responsibility.” *Theory, Culture & Society* 27, nos. 2–3: 9–30. <http://dx.doi.org/10.1177/0263276409361915>.
- Weitzman, Martin L.
 2014 “The Geoengineered Planet.” In *In 100 Years: Leading Economists Predict the Future*, edited by Ignacio Palacios-Huerta, 145–64. Cambridge, Mass.: MIT Press.
- Woodward, Jamie
 2014 *The Ice Age: A Very Short Introduction*. Oxford: Oxford University Press.