

Why We Disagree About Climate Change

UNDERSTANDING CONTROVERSY,
INACTION AND OPPORTUNITY

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The Social Meanings of Climate

We are used to talking about summer heat in our poetry, but it is only when a real spell of it comes to us that we discover how rare it is. This July the whole countryside looks at the same time both strange and familiar. There is the corn, ripe as if it were the middle of August, and the dark foliage of later summer, but all our Northern landscape, unchanged in its forms and objects, is transfigured by the colours of the South. Usually, even in fine summer weather, there is a Northern coolness in our mornings and evenings; but now one is startled even in the early morning by the Southern splendour both of earth and sky (*The Times*, 26 July 1911).

The performance of the British climate over the past few months can at best be described as perfidious. After several very mild winters and two beautiful summers, including the most severe drought since records began 250 years ago, the climate has lurched to the other extreme ... the period from September 1976 until last June was the wettest for a hundred years (*The Times*, 19 August 1977).

So what can Britain expect as the blanket of greenhouse gases around the planet thickens? As the temperature nudged record levels last summer, the Met Office said that we should get used to such prolonged periods of settled, dry weather. There is a significant human contribution to these heatwaves because of carbon dioxide emissions over recent decades ... This is a sign of things to come ... Three years ago ... scientists ... showed that human emissions of greenhouse gases

had more than doubled the risk of record-breaking heatwaves such as the one that is reckoned to have killed 27,000 people across Europe in 2003. By the 2040s, one summer in two is predicted to be hotter than 2003 (*Guardian*, 21 May 2007).

1.1 What is Climate?

We love our climate – and yet we fear it. As the above three interpretations of the climate of Britain reveal, we are not quite sure what to make of the idea of climate: we can celebrate its power to evoke strong emotions in us, while also bemoaning its unpredictability or fearing its future behaviour. We expect climate to perform for us; to offer us the weather around which we work and create and within which we relax and recreate. Yet we know too that climate is fickle, with a will and a mind of its own, offering us not only days of tranquillity and repose, but also the storms and dangers that our ancestors encountered over countless centuries and that continue to afflict us today.

Climate offers material benefits for all human cultures: the rain, wind, sun and warmth that waters, powers and feeds our lands and machines. Climate also offers resources for our aesthetic and spiritual imaginations: the clouds and sunsets which inspire our poetry, the seasonality around which we develop rituals. These benefits are often precarious, however, and this insecurity is a powerful driver of human innovation. New technologies, practices and systems are created to build social resilience in the face of a capricious climate. Constancy of climate is rare. Conversely, the precariousness of climate has also been invoked in explanations of the collapse of civilisations. Climatic stability has often been presumed to be a prerequisite for the stability of civilisations although, as we shall see later, the idea of climate change triggering societal collapse is itself not stable.

There may be 'good' or 'benign' climates and 'bad' or 'dangerous' climates, but only in the sense that climates acquire such moral categories through human judgements – judgements that suit our

convenience or our capabilities. We do not judge climates against any fixed or universal morality. Is a 'good' climate a stable or a varying one? Is a 'bad' climate an unpredictable climate or one that is either too hot or too cold for our predilections? If you were going to design the ideal climate, what would it look like? All climates are difficult and yield dangers, yet all climates are fruitful and inspire creativity. There are few climates on Earth where humans have not lived and survived. Humans can accommodate a much greater range of the available climatic space than the ancient Greeks and early Medievals supposed. Sophisticated human civilisations are sustained in climates as dramatically different as that of 'torrid' Saudi Arabia (mean annual temperature 24°C) and 'frigid' Iceland (2°C) (see Figure 1.1). Yet there are few climates which, equally, do not carry danger or risk.

Since we are going to spend the next 300 or so pages exploring the reasons why we disagree about climate change, it is important that we dwell for a while on this idea of climate. Climate cannot be experienced directly through our senses. Unlike the wind which we feel on our face or a raindrop that wets our hair, climate is a constructed idea

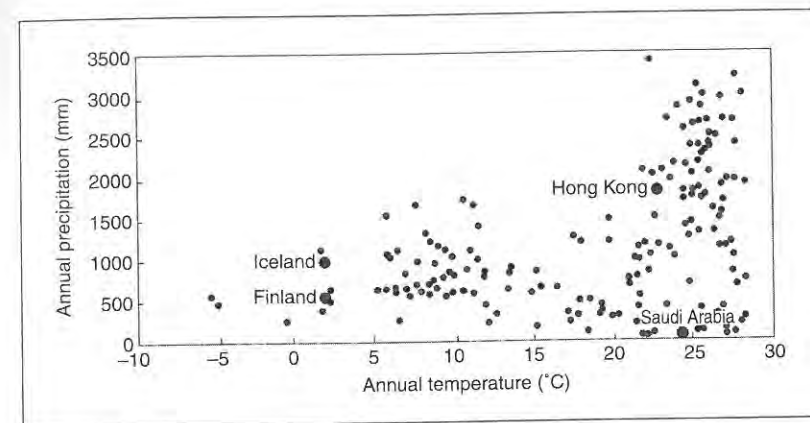


FIGURE 1.1: The range of 'national climates' plotted according to annual average temperature (°C) and precipitation (mm) using statistics for the period 1961–90. Each dot represents the climate of one country.

that takes these sensory encounters and builds them into something more abstract. Neither can climate be measured directly by our instruments. We can measure the temperature of a specific place at a given time, but no-one can directly measure the climate of Paris or the temperature of the planet. Climate is an idea that carries a much richer tradition of meaning than is captured by the unimaginative convention that defines climate as being 'the average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity and precipitation'.¹ This chapter offers a guide to what this idea of climate means, using the insights offered by history, geography and anthropology.

Climate has both physical and cultural connotations. It has physical significance: one cannot deny that the climate of the Amazon is wetter in an absolute sense than is the climate of the Sahara. But climate also carries cultural interpretations: the climate of the Sahara means something quite different to a Bedouin than it does to a Berliner. We will explore these physical and cultural approaches to thinking about climate in Sections 1.2 and 1.3, respectively. Our ideas of climate may also carry more deliberate and entrenched meanings, being used to secure political or ideological goals. Ideas about climate are always situated in a time and in a place. As history gets rewritten and geography gets reshaped, so also change our ideas of climate. Climates can change physically, but climates can also change ideologically. Some of the ways in which the idea of climate has been a vehicle for promoting different ideologies, different ways of seeing the world, are explored in Section 1.4.

The idea of climate change, the subject of our book, is also an idea that has served many different purposes, and continues to do so. One of the most enduring of these is the way in which we have written about the human story using the language of climate change: the story of human evolution and the rise and fall of civilisations. Section 1.5 therefore offers a brief historiography of the different ways

¹ Merriam-Webster Collegiate Dictionary (1998) 10th edn.

in which we have written about climate change and human civilisation, about how we have frequently constructed antagonistic relationships between the vicissitudes of climate and the fates of nations and empires. The themes of the chapter, which reappear in various forms later in the book, are summarised in Section 1.6.

1.2 The Physical Basis of Climate

The idea of climate was first given linguistic form by the Greeks. The Greek word κλίμα, or *klima*,² was used as early as the sixth century BC by Pythagoras's disciple Parmenides to differentiate between five zones on the surface of the supposed spherical world. These latitudinal zones related directly to the inclination of the sun's rays on the Earth's surface, ranging from the torrid zone at the Equator to the frigid zone of the far North. These earliest attempts at climatic classification revealed the precariousness of the human relationship with climate. While the Greeks inhabited the forgiving temperate zone of the eastern Mediterranean, the frigid *klimata* of the North and the torrid *klimata* of the South were realms which gifted a legacy only of danger, or even death. Later Greeks further extended the idea of physical climates being dependent on latitude, and Ptolemy's seven *klimata* from the second century AD persisted as the conventional framework for explaining different climates well into the early Renaissance period.³

Attaching climate to latitude, to the inclination of the sun on the Earth's surface, lent a certain rigidity and constancy to the idea of climate which European explorers of the fifteenth and sixteenth centuries began to question. And as they did so, they raised wider questions about the authority of classical Greek science, as noted by historian

² Literally, 'slope' or 'incline'.

³ Sanderson, M. (1999) The classification of climates from Pythagoras to Köppen. *Bulletin of the American Meteorological Society* 80(4), 669–73. Sanderson gives examples of world maps from the sixteenth century in which Ptolemy's seven climatic zones still offered the standard classification of known climates.

Craig Martin: 'The common experience of travellers to the New World ... [showed] ... that the theory of uninhabitable climatic zones was untenable and therefore [that] Aristotelian science was incomplete and fallible.'⁴ Not only did Europeans survive the torrid and deathly climates of the Equator, they began to realise from far-off longitudes that latitude alone was a poor predictor of the climates they experienced. Enabled by the instrument revolution of the seventeenth and eighteenth centuries – which yielded barometers, thermometers and rain gauges – new ways emerged of understanding the physical and geographical attributes of climate.

The predominant means of capturing the physicality of climate was to be through meteorological measurement;⁵ initially through individuals recording observations of the weather in private diaries and later, towards the end of the eighteenth century, through systematic and centralising networks of measurement. The application of standardised and regularised methods of observation of the natural world – one of the hallmarks of Western Enlightenment rationality – to what had previously been largely a philosophical or sensual endeavour, opened up new ways of describing climate and thinking about what it meant. Order was imposed on seemingly chaotic weather; first, by quantifying it locally at individual places and, subsequently, by constructing statistically aggregated climates from geographically dispersed sites. Climate for the first time became 'domesticated', revealing that, for example, British climate was 'generally temperate overall, but punctuated by bracing diurnal variations'.⁶

⁴ p. 3 in Martin, C. (2006) Experience of the New World and Aristotelian revisions of the Earth's climates during the Renaissance. *History of Meteorology* 3, 1–16.

⁵ There were other ways of capturing and describing the physical dimensions of climate: through its impacts on vegetation, phenology, ice cover, soil moisture. The Chinese had been particularly adept at recording such climatic indicators, some of them as far back as 1100 BC.

⁶ p. 22 in Golinski, J. (2003) Time, talk and the weather in eighteenth century Britain, in Strauss, S. and Orlove, B. J. (eds), *Weather, climate, culture*. Berg: Oxford, pp. 17–38.

This quantification and standardisation of climate opened up new possibilities of interpretation and practical utility. Comparative climatic analysis could be undertaken, relying on numerical data rather than hearsay; an attractive prospect for nineteenth-century colonists and traders – how different was the climate of Cape Town from that of Amsterdam? And longitudinal studies of climate through time now became possible, providing a formal alternative to the reach of human memory – how stable really was climate?

As the nineteenth century began, this new way of describing climate through quantification of its physical attributes was gaining ground.⁷ Standardisation of meteorological measurements was extending into the Americas and the tropical world, vigorously promoted by scientific entrepreneurs such as Alexander von Humboldt and the American meteorologist Matthew Maury, and the first systematic and quantitative large-scale climatologies were produced. In 1848, the Prussian physicist Heinrich Dove published the first global maps of monthly mean temperature, followed in 1883 by Austrian meteorologist Julius Hann's monumental *Handbüch der Klimatologie*. Its three volumes covered general, regional and local climates, and although Hann captured these climates primarily through the growing number of instrumental measurements, his third volume on local climates continued to use literary and eye-witness descriptions. The direct sensory and imaginative impacts of physical climate on the human mind were still seen as legitimate registers.

The quantitative and naturalistic approach to conceptions of climate found its ultimate expression in two of the most famous climatological products of the twentieth century. The Köppen classification

⁷ For example, Clarence Glacken, in his 1967 book, *Traces on a Rhodian shore: nature and culture in Western thought from ancient times to the end of the eighteenth century*. University of California Press: Berkeley, CA, quotes (p. xv) Count Volney from his 1804 work on the climate and soil of the USA as remarking on the shift of meaning of the word 'climate', saying that 'the term climate is now synonymous with the habitual temperature of the air'.

of world climates, which Russian geographer Wladimir Köppen originated and refined between 1900 and 1936 and which is still in use today, marked the end of the transition from the original Greek classification of climate based on latitude. In Köppen's classification, the geographical complexities of regional climates are mapped by grouping together those climates whose statistical properties yield similar natural vegetation types. This leads to an infinitely more subtle arrangement of physical climates than imagined by Ptolemy.

A second icon of this physical approach to climate was first constructed only in the latter decades of the last century. The millions of individual thermometer readings taken around the world since the middle of the nineteenth century were compiled and synthesised into an index of an abstracted global climate – the globally averaged surface air temperature (Figure 1.2). This index of world climate – reconstructed back to 1850 and now routinely updated each month – both hides and reveals. It hides all of the heterogeneity of weather experienced in local

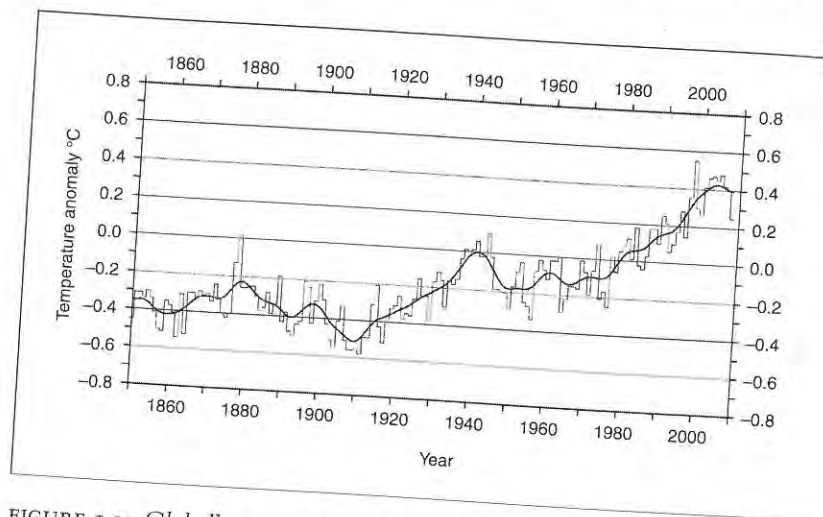


FIGURE 1.2: Globally averaged surface air temperature for the period 1850–2008, expressed as anomalies from the 1961–90 average (°C). 2008 data are provisional.
Source: Redrawn from Climatic Research Unit, UEA, website (accessed 9 July 2008).

places by local people and yet, by collapsing this diversity into a single numerical index, it reveals the behaviour of a large and complex global system. As we shall see later, this index has fulfilled many functions in the scientific and political discourses surrounding climate change; most importantly, perhaps, in lending simple and numerical visibility to the idea of climate (here measured as temperature) as an emergent property of an interconnected and physical global system.

The climatologists and meteorologists of the nineteenth century made the bravest attempts to reify climate, using a series of formal statistical rules to turn climate for the first time into an entity with quantitative description. This, of course, is how climate continues to be used in the physical and mathematical sciences, and opens up all sorts of possibilities for predicting future climate (in this physical sense). It is not surprising that, with its analytical roots so firmly planted in meteorology, the dominant popular understanding of climate therefore remains this numerical and statistical one. Thus the World Meteorological Organization insists that the climate of a place or region can only be robustly defined once it has been compiled from at least thirty years of meteorological measurement. Or to put it more pithily, 'Climate is what you expect, weather is what you get.'

The distinction between climate and weather remains one of the more elusive in popular discourse. While a degree of verbal ambiguity is appropriate for social intercourse, in analytical applications a more formal distinction becomes necessary. One way of visualising this distinction is shown in Figure 1.3, which uses the filter of time to demonstrate how we move between using descriptions of climate and weather depending on the relationship of the respective era to the present. The farther back in time we look, and certainly earlier than the last three or four centuries, the more our reconstructions of the past rely upon notions of climate rather than weather. Similarly, beyond the medium-range weather forecast, our descriptions of the future almost always reveal climatic categories rather than revealing weather events. On these distant past and future time-scales, the weather – the

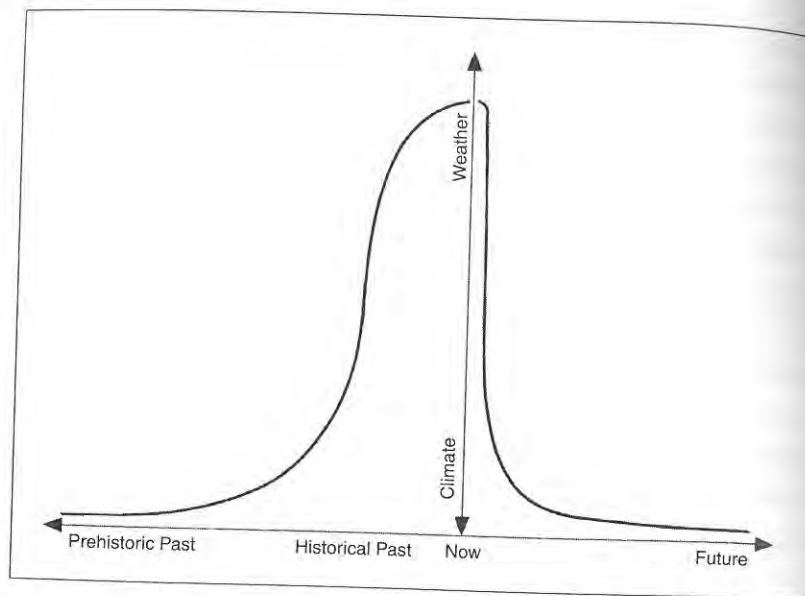


FIGURE 1.3: Sketch diagram showing how we move between talk of 'climate' and talk of 'weather' depending on the relationship with the present. We can only access 'weather' for the next few days or for the past few centuries.

minute-to-minute, day-to-day experience of the outcome of meteorological processes – is largely hidden from us. We inevitably adopt the convenient shorthand of allowing climate to stand in for weather.

We have discussed the idea of climate thus far in predominantly physical terms. But the etymological origins of the word 'climate', and its subsequent attachment to aggregated meteorological measurements and eventually to the predictive natural sciences, only incompletely captures the subtlety and multiplicity of meanings with which the word 'climate' has been endowed. There have been many other ways of working with the idea we call climate; ways both less formal and more symbolic than those favoured by meteorologists. Thus climate may also mean 'the prevailing attitudes, standards or environmental conditions of a group, period or place';⁸ a qualitative and less tangible

⁸ On-line dictionary <http://dictionary.reference.com/> [accessed 9 July 2008].

meaning than the statistical definition of physical climate employed by the World Meteorological Organization. Climate can be used to describe the prevailing milieu in politics, in the economy, or in a relationship – hence we talk about a region experiencing a 'climate of political unrest', about changes in the 'economic climate' of a nation, or find it used as literary symbolism, as in Nancy Mitford's 1949 novel *Love in a Cold Climate*.

These twin meanings – the meteorological and the metaphorical – of the English word 'climate' are also found in other languages; for example, Italian, Spanish, Thai, Chinese and Russian. In other languages, however, the idea conveyed by the word 'climate' is more complicated still. Anthropologist Timothy Leduc has explained the difficulties in translating the most relevant Inuktitut term '*sila*' into English. The Inuit of northern Canada use '*sila*' to talk about the 'weather' and 'climate' – the physical meteorology of the air – but also use the same word to describe the 'spirit of the air, a mystic power which permeates all of existence'.⁹ In societies such as the Inuit, the separation of the idea of climate into distinct physical and cultural dimensions is linguistically prohibited. As explained by geographer David Livingstone, we therefore see that 'whilst ordinarily thought of as simply a constituent element of the natural order, climate has consistently surfaced as a cultural category'.¹⁰ It is to this cultural category of meaning that we now turn.

1.3 The Cultural Basis of Climate

The ease with which we use 'climate' in its metaphorical sense helps us to understand that there are other ways of conceiving

⁹ p. 237 in Leduc, T. B. (2007) *Sila dialogues on climate change: Inuit wisdom for a cross-cultural interdisciplinarity*. *Climatic Change* 85, 237–50.

¹⁰ p. 79 in Livingstone, D. N. (2004) *Climate*, in Thrift, N., Harrison, S. and Pile, S. (eds), *Patterned ground: entanglements of nature and culture*. Reaktion Books: London, pp. 77–9.

climate's relationship with the physical world than solely through the meteorological statistics captured and reported by the World Meteorological Organization. Climate has always carried a deeper, precarious and more ambiguous meaning for humans than the merely prosaic.

Our biological 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 mythologising and taming the workings of Nature's climate. The trail of the flood myth, for example, can be traced through many early cultures, most notably in the story of the Biblical Flood in the monotheistic religions of Judaism, Christianity and Islam. American cultural historian Clarence Glacken, in his 1967 masterpiece *Traces on a Rhodian Shore*, observed how the idea of climate has been used in Western thought to explain elements of human character, activity and culture. Hippocrates, in the fourth century BC, was the earliest to develop such an association through interweaving the histories of medicine, geography and anthropology in his treatise on *Airs, Waters, Places*. In this Hippocratic sense, the physicality of climate acts as a constraint on human action and as a shaper of human fortunes. 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 idea of climate also interacts with the human psyche and with cultural practice in less material and more imaginative ways. Climate is frequently bound up in our sense of national identity, threading its way into many aspects of our social memory, while climatic extremes are adopted as anchors for personal memory in both modern and traditional societies. There are few inhabitants of New Orleans from August 2005, for example, who will not end their lives being able to relate events in their life story to either pre-Katrina or post-Katrina eras. The human experience of climate releases powerful emotions

which can be both benign and threatening. Various studies have shown correlations between climatic fluctuations and, for example, sexual activity or suicide rates. Indeed, throughout the human experience of realised climate and our anticipation of portended climates, there runs a thread of anxiety and fear: '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.'¹¹ The persistent use of visual icons of glaciers and palm trees – ice sheets or deserts – as signifiers of climatic danger reveals such anxiety.¹²

As we have observed earlier, until the eighteenth century climate was largely unquantified – and unquantifiable. Weather and climate were described in qualitative and impressionistic terms, expressing beauty or prosperity, danger or threat; the latter commonly carrying portentous meaning. Experiences of extreme weather – as of other natural phenomena such as earthquakes – have long been interpreted by individuals and cultures as signifiers of divine blessing or judgement. The relationship between God and climate, especially drought, portrayed in the early Jewish scriptures, for example, reveals this particular reading of weather extremes. A theological interpretation of the capriciousness of climate remained dominant in western Europe through the later Middle Ages and well into the early modern period. It remains a common frame today in many traditional cultures.¹³

The fears evoked by unprecedented extremes of weather were fuelled by a particular understanding of the relationship between God

¹¹ p. 149 in Boia, L. (2005) *The weather in the imagination* (trans. R. Leverdier). Reaktion Books: London.

¹² For evidence of such iconography in European literature and media reporting, see Brönnimann, S. (2002) Picturing climate change. *Climate Research* 22, 87–95.

¹³ And also in some supposedly non-traditional societies. In July 2007, the Anglican Bishop of Carlisle claimed that the extensive flooding in parts of northern and central England caused by heavy rains were a judgement from God: 'We are reaping the consequences of our moral degeneration, as well as the environmental damage that we have caused.' (*Sunday Telegraph*, 2 July 2007).

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 were viewed as the territory within which both divine and satanic influences were at work. Through the attachment of extremes of weather to divine retribution or demonology, climate frequently remained associated with fear through the late Middle Ages and early modern periods.

Although the theological language may have changed, Western societies continue to be attracted to the idea of moralising the performance of climate, or at least to moralising the driving forces that lie behind climate. British scientist Jim Lovelock's original idea of personifying the biophysical Earth system using the metaphor of Gaia – the Earth Goddess – has had a profound influence on some of the ways in which science and society have come to view climate and to speak about it. Rather than being a function of God's displeasure, extreme climatic behaviour can now be interpreted as Gaia's revenge on a morally wayward and abrasive humanity. Thus the eminent American oceanographer Wally Broecker is comfortable using the metaphor of an 'angry beast' to describe climate change – 'the climate system is an angry beast and we are poking at it with sticks'¹⁴ – reminiscent of many non-Western forms of personifying Nature. Secular culture is reinterpreting a more ancient human instinct.

As well as describing a physical reality, climate then can also be understood as an imaginative idea – an idea constructed and endowed with meaning and value through cultural practice. Registers of climate can be read in memory, behaviour, text and identity as much

¹⁴ p. 7 in Broecker, W. S. (1999) What if the conveyor were to shut down? Reflections on a possible outcome of the great global experiment. *Geological Society of America Today* 9(1), 1–7.

as they can be measured through meteorology, as science historian Jan Golinski shows in his enlightened survey of eighteenth-century British attitudes to weather and climate: 'This ... view of the climate was bound up with the sense of British national identity.'¹⁵ A cultural reading of climate is also necessary to understand the original meaning of climatic phenomena such as El Niño in the Pacific Ocean. El Niño – literally 'the boy' or 'the small one' – was the name given by Roman Catholic Peruvian fishermen in the nineteenth century to a warm coastal current that appeared sporadically along the shores of Ecuador and Peru. By bringing welcome relief from the cold waters that usually prevailed and by watering the arid coastal deserts, and because this warm current usually appeared around Christmas-time, the climatic phenomenon became identified with the character of Jesus Christ, a natural blessing associated with the Saviour of the World.

I want to suggest that the separation of the cultural from the physical that is implicit in the now dominant understanding of the idea of climate is a peculiarly Western separation. It is one which gained ascendancy as the Enlightenment project unfolded in Europe and as its ripples were felt further afield. The separation of Culture from Nature, illustrated above in the way we have presented the idea of climate as either physical or cultural, has been suggested by the French sociologist Bruno Latour to be one of the essences of modernism. Such dualism was rarely found in traditional non-Western cultures and yet exposure of such cultures to Enlightenment rationality has influenced the way in which climate is perceived. As anthropologist Julie Cruikshank observes: 'The [Western] idea that a measurable natural world might be prised from its cultural moorings has continued to insinuate itself in locations and landscapes where local understandings were conventionally framed very differently.'¹⁶ In such locations and landscapes,

¹⁵ p. 57 in Golinski, J. (2007) *British weather and the climate of enlightenment*. University of Chicago Press.

¹⁶ p. 245 in Cruikshank, J. (2005) *Do glaciers listen? Local knowledge, colonial encounters and social imagination*. UBC Press: Vancouver, Canada.

the traditional understanding of climate was instinctively and deeply loaded with cultural meaning, as illustrated in Box 1.1 describing early Icelandic colonists. Evidence of such holistic approaches to thinking and living with climate can still be found today; for example among African pastoralists and the Canadian Inuit.

Box 1.1: Climate in Icelandic Sagas¹⁷

The Sagas of the Icelanders were written in the thirteenth and fourteenth centuries and recount stories of prominent Icelandic families during the early settlement period of Iceland by the Vikings around the tenth century AD. These Sagas, a unique genre of medieval literature, reflect the way in which Icelanders thought and talked about the climate and their relationship to it. The natural land- and seascapes were so closely entwined with their cultural expressions that one cannot separate Nature from Culture. In medieval Icelandic society, as with most traditional or pre-modern societies, climate was an integral part of Culture. One could not observe and analyse climate dispassionately from outside; one could only experience and interpret climate from inside the culture.

The sea and sailing were central to the lives of these Vikings. Sea traffic between Iceland, Norway and Greenland and the New World was vital for subsistence and communication. The Vikings had an intimate knowledge of the ocean climate – sea-ice, storms, winds – based on careful observation handed down from generation to generation. The climates encountered on the open ocean were respected as sentient beings, as the gods Aegir and Hler, who

¹⁷ Box 1.1 draws upon material in Ogilvie, A. E. J. and Pálsson, G. (2003) *Weather and climate in Icelandic sagas*, in Strauss, S. and Orlove, B. S. (eds), *Weather, climate, culture*. Berg: Oxford, pp. 251–74.

could act as both givers and takers of life. The medieval Icelandic economy was based on livestock farming and the annual hay harvest was central to survival. The Sagas contain many references to the abundance or otherwise of summer harvests and the harshness of winter conditions. For subsistence farming and fishing in harsh environments, the reliability of climatic knowledge and weather signs was often critical. Acute observation and respect for the cultural and economic signifiers of changes in climate were central to these Icelandic conceptions of climate itself.

Climate was also used metaphorically in the Icelandic Sagas to suggest powerful human emotions. Thus the dark thoughts of the mind were likened to ‘dark mists that are drawn up out of the ocean’, while the brightness of a woman’s warm and gentle love compared to ‘sunshine and gentle weather’. Changes in weather were also used to embody meanings hidden in the narrative. In the story of two warrior friends, Thorgeir and Thormod, the reader becomes aware that ‘the day has been bright with sunshine but the weather is now starting to thicken’ signifies that events in the human world are also about to turn unpleasant.¹⁸

The difference in the approach to climate between the Western rationalist tradition and that implicit in much local environmental knowledge is a difference we will dissect in more detail in later chapters. For now we need to explore a further aspect of how the idea of climate is entangled in the human cultures which experience and talk about it. We need to understand the ways in which the idea of climate is often called upon to act as a justification and conveyor of ideology.

¹⁸ *Ibid.*, p. 265.

1.4 Climate as Ideology

The classical Greek idea of climate served several purposes. Climates to the far north were too cold and those in the far south too hot to allow significant human cultural development. The climates of the intermediate Mediterranean zone, on the other hand, were just perfect for the blossoming of human creativity, expressed through culture, wealth creation and innovation. This circularity of reasoning was therefore a way of simultaneously explaining and justifying Greek hegemony in the classical world.

Jump forwards to our own century and we find that contemporary natural science conceives climate very differently. Rather than differentiated climates in particular places, the dominant intellectual frame is to see climate as a globally functioning holistic system; the totality of the atmosphere, hydrosphere, biosphere and geosphere, together with their interactions. Climate now connotes 'less the weather of any particular place than something more closely akin to the global environment: a natural object to be understood, investigated and managed on planetary scales'.¹⁹ And this investigation and management requires the skills of the planetary scientist. This conception of climate is different from the Greek *klimata*, but the end result is the same. Climate as an idea simultaneously explains and justifies – in this case – the hegemony of the Earth (or climate) system scientist.

The idea of climate has been changing as much as, if not more than, the physical climate itself. Climate has been as much a carrier for ideologies²⁰ in the past as it continues to be in the present. We will discover evidence of the different ideological burdens borne by climate as we move through the book, but for now let us briefly note four

¹⁹ p. 7 in Miller, C. A. and Edwards, P. N. (eds) (2001) *Changing the atmosphere: expert knowledge and environmental governance*. MIT Press: Cambridge, MA.

²⁰ By 'ideology' is meant 'the body of doctrine, myth, belief, etc., that guides an individual, social movement, institution, class, or large group'. Marxism and racism are obvious examples of ideologies; science and religion more controversially so.

of the more interesting ones that have revealed themselves: racism, mastery of Nature, the wildness of Nature, and system (in)stability.

Racism

The idea that the character of different races is shaped, or even determined, by climate has been one of the more enduring in the intellectual history of climate. We have already alluded to the way in which Greek conceptions of climate 'fortuitously' lent the Aegean Sea the most hospitable climate of the classical era. Herodotus, in the fifth century BC, could therefore understand the difference between Egyptians and Greeks: 'In keeping with the idiosyncratic climate which prevails there and the fact that their river behaves differently from any other river, almost all Egyptian customs and practises are the opposite of those of everywhere else.'²¹ In similar vein, Hippocrates could 'explain' the triumphs of Alexander over the Persian Empire in terms of contrasting climate-moulded racial character; the energy of Europe winning over the 'softer' character of Asia.²²

Similar reasoning can be found in Arab literature from the fourteenth century – the Tunisian geographer Ibn Khaldun – and in the writings of late Renaissance and early modern European thinkers – Jean Bodin, Baron Montesquieu and David Hume. The father of the Enlightenment, German philosopher Immanuel Kant, could therefore remark in 1775: 'The inhabitant of the temperate parts of the world, above all the central part, has a more beautiful body, works harder, is more jocular, more controlled in his passions, more intelligent than any other race of people in the world. That is why at all points in time these peoples have educated the others and controlled them with weapons.'²³

²¹ Herodotus, *The histories* (trans. R. Waterfield, Oxford, 1998), Book 2, p. 35, cited in Boia (2005), *The weather in the imagination*, p. 23.

²² Boia, *The weather in the imagination*, p. 25.

²³ From Kant, I. (1775) *On the different races of Man*, cited in Livingstone (2004) *Climate*, p. 78.

The most developed articulation of this line of reasoning, of using a conception of climate to support a racist ideology, came from the American geographer Ellsworth Huntington in the early decades of the twentieth century. Drawing upon a number of empirically based studies examining the productivity of factory workers under different climatic conditions Huntington reaffirmed what Hippocrates, Ibn Khaldun and Montesquieu would also have 'known', namely 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'.²⁴ Huntington's views, and those of other early twentieth-century geographers and philosophers, strike us today as naïve and even dangerous, and yet the deterministic philosophy underpinning such thinking can still lurk near the surface. Thus a 1993 analysis of the relationship between climatic characteristics and political stability concluded that 'it may never be possible to prove absolutely that a mild climate in mid-latitudes helps to foster a tolerant society or that an extreme climate may predispose people towards intolerance ... however, the historical record is highly suggestive [of such a link]'.²⁵

William Meyer, in his fascinating survey of *Americans and Their Weather*, coins the term 'meteorological fundamentalism'²⁶ to rebuke those who implicitly or explicitly assume that the significance of climate can be established purely from its physical characteristics without regard for cultural conditioning or human agency. Traces of such climatic fundamentalism can be found in some of the current rhetoric around the idea of wars, conflicts and refugees induced by climate change. Many have claimed, for example, that the violence and civil

²⁴ p. 2 in Huntington, E. (1915/2001) *Civilisation and climate*. University Press of the Pacific: Honolulu, HI.

²⁵ pp. 63–4 in Beck, R. A. (1993) Viewpoint: climate, liberalism and intolerance. *Weather* 48, 63–4.

²⁶ p. 71 in Meyer, W. B. (2000) *Americans and their weather*. Oxford University Press.

war in Darfur, western Sudan, during recent years has been largely driven by changes in climate: 'Darfur remains a dramatic example of how a small shift in climate can have dramatic and horrifying human consequences.'²⁷

Mastery of Nature

Ellsworth Huntington's legacy can also be traced in the way in which climate has been used to reveal and propagate the ideology of human mastery of Nature, specifically the mastery of climate. Huntington ended his 1915 book, *Civilisation and Climate*, with these words, 'If we can conquer climate, the whole world will become stronger and nobler.'²⁸

The idea that climate is a physical manifestation of the natural world that is available for 'conquering' is recurrent throughout the intellectual history of the West. Clarence Glacken's survey of 2,000 years of Western environmental thought²⁹ adopts the idea of human modification and control of Nature as one of the three enduring themes throughout this period of Western history, although it is only in the last 200–300 years that humans – either through technology or through sheer weight of numbers – have realised the full extent of their influential abilities. Climate has been the object of many attempts at 'conquering' – whether of local, regional or now global climates – and the deep-seated appeal of this ideological project is suggested by the diverse cultural and political settings in which these attempts have been launched. Box 1.2 gives examples from such unlikely ideological companions as Victorian imperialism, American capitalism and Soviet communism.

²⁷ p. 48 in Walker, G. and King, D. (2008) *The hot topic: how to tackle climate change and still keep the lights on*. Bloomsbury Press: London. This claim is refuted by: Kevane, M. and Gray, L. (2008) Darfur: rainfall and conflict. *Environmental Research Letters* 3 doi:10.1088/1748-9326/3/3/034006 10pp.

²⁸ Huntington, *Civilisation and climate*, p. 294.

²⁹ Glacken, *Traces on a Rhodian shore*.

Box 1.2: The Conquering of Climate³⁰

Victorian Imperialism. Danger surrounded the Victorian conception of tropical climates. Whether due to degeneracy, depravity or debility, the encounters with the unknown climates of southern Asia, Africa and South America by white settlers evoked fears and anxieties about climate that emerged from the imperial ideology of the time. These newly encountered climates took on the roles ascribed to them by the prevailing and dominant culture. The moral 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? 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’.

Tropical climates *were* conquered, in a literal as well as a metaphorical sense. As the European imperial adventure lost its way in the twentieth century, the psychological hold on the European mind of the pathology of tropical climates was dissipated. It was widely regarded that sustainable colonisation of India by Europeans required periodic escape by the settlers to the cooler climate of the Indian hills, driving the construction of hill stations as white enclaves. And later improvements in tropical medicine and air-conditioning technologies removed some of the direct physical fears

³⁰ The sources for Box 1.2 are: Fleming, J. R. (2006) The pathological history of weather and climate modification: three cycles of promise and hype. *Historical Studies in the Physical and Biological Sciences* 37(1), 3–25; and Hulme, M. (2008) The conquering of climate: discourses of fear and their dissolution. *Geographical Journal* 174(1), 5–16.

that 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.’³¹

American Capitalism. Another route to the conquering of climate lay through scientific weather modification, a practice first advocated in the United States of America during the nineteenth century. Burning large tracts of forest to accelerate rain-making thermal currents was one of the first methods tried in 1849 by the meteorologist James Espy (also known as ‘The Storm King’), although success eluded him. A later attempt by a retired general from the American Civil War, General Daniel Ruggles, and a Washington patent lawyer, Robert St. George Dryenforth, used the so-called ‘concussion theory’ of rain-making to induce rain in the Texan outback. The US Congress allocated \$10,000 for this experiment in 1891 in which large explosions in the atmosphere were triggered in an attempt to keep the weather in an unsettled condition. No lucrative patent was forthcoming.

These idiosyncratic attempts at conquering climate through bringing the weather under human control presaged more serious and scientifically well-founded efforts later in the twentieth century to modify rainfall through cloud-seeding. The scientific entrepreneur Irving Langmuir was the great enthusiast for this technology, claiming that seeding clouds with dry ice or silver iodide opened possibilities for redirecting hurricanes, generating artificial snow storms, and watering the arid lands of Arizona. Although this technology has not promised all that Langmuir had hoped, it continues to attract investment today. In 2007, the

³¹ Huntington, *Civilisation and climate*, p. 291.

Chinese reported a successful attempt to create snowfall over the city of Nagqu in Tibet by seeding clouds with silver iodide. 'This proves it is possible to change the weather on the world's highest plateau.'³²

Soviet Communism. The desire to conquer climate reached its apogee during the 1960s in Soviet Russia. In keeping with Stalin's Great Plan for the Transformation of Nature, Russian authors, visionaries and engineers imagined numerous ways to bring Russian climate, if not world climate, under centralised control. Schemes to dam the Bering Straits to melt Arctic ice and warm northern Russian shores; to flood the Qattara Depression in Egypt to bring rain to the Sahara; or to divert the Gulf Stream with a dam between Florida and Cuba to enhance the northward flow of warm water all featured in the large imaginations of these Soviet entrepreneurs. Climate was to become another site of ideological conflict between West and East as the communists saw the diversion of the River Congo into the northern dry heartland of Africa as a way to counter growing American economic imperialism in Africa.

And it was in part reaction to this ideological battle, combined with the first inkling of worldwide changes in climate induced by rising concentrations of carbon dioxide in the atmosphere, that the USA first endorsed their own rationale for large-scale climate control. In 1965, President Johnson's Science Advisory Committee suggested that 'the possibilities of deliberately bringing about countervailing climatic changes ... need to be thoroughly explored'³³ More than forty years later their wish is now being fulfilled.

³² p. 957 in *Nature* 446, 26 April 2007.

³³ p. 127 in President's Science Advisory Committee (1965) *Restoring the quality of our environment*. Report of the Environmental Pollution Panel (November), Washington DC.

This ideological project to conquer and control climate continues today at both a micro and a macro level. Most new cars now sold advertise their ability to 'climate control' the ambient air temperature inside the vehicle. By engineering the exchange of air and heat into and out of the body of the car, (micro-)climate can be brought under human mastery. 'Climate control' is also a project on the planetary scale. An increasing number of schemes have been put forward to geo-engineer the global climate, to manipulate the physical functioning of the Earth's system in such a way as to achieve a stated climatic goal or to limit a feared climatic disturbance. Injecting sulphur into the stratosphere, sucking up biologically productive cold water from the deep oceans, building carbon dioxide extraction machines in the free atmosphere, are all suggestions revealing latter-day attempts to master and conquer climate. That such proposals are advocated in response to *our* inadvertent modification of world climate – and thus to 'limit global warming' to some desirable level – does not weaken the argument. The point is that the enduring idea of climate mastery reveals an ideological position that humans have the desire, the right and the means to control the climatic forces of Nature.

The wildness of Nature

This brings us to a third example of how climate has been used to carry diverse meanings – the ideology of the wild. In direct contrast to the claims and goals of mastering and controlling climate, this discourse sees climate as a repository of what is natural, something that is pure and pristine and (should be) beyond the reach of humans. Climate therefore becomes something that is fragile and needs to be protected or 'saved', just as much as do natural landscapes or animal species. These are goals which have fuelled the Romantic, wilderness and environmental movements of the Western Enlightenment over two centuries or more. Of course it can be argued about when and why Nature first became a separate category in the human imagination, or indeed whether the category of wildness exists in any substantive

sense. There is no denying, however, that the idea of wildness has been a persistent mode of discourse over recent centuries and that by losing wildness, by taming or mastering Nature, humans are diminishing themselves and maybe something beyond themselves.

Bill McKibbin, in his classic book *The End of Nature*, gives powerful voice to this sentiment with regard to climate. His lament for the end of Nature finds its highest expression in the transition from a natural climate to a climate which is being modified through human interference with the global atmosphere. That 'a child will now never know a natural summer'³⁴ is for McKibbin a cause of sadness and of loss. That global climate is no longer safe from the contaminating influences of the human species speaks symbolically of just how deeply humans have penetrated the idea of the natural.

System (in-)stability

And it is perhaps this ideology of wildness, the idea of world climate as the ultimate refuge of the natural, which has driven much of the thinking which lies behind the fourth example I use of how we load climate with our ideologies. If an untouched climate, a pure and natural climate, is to be valued, then maintaining its stability becomes of prime, even sacrosanct, importance. Climate thus becomes freighted with the ideology of stability and order in Nature, as opposed to ideas of change and chaos.

The ideology of stability fits very well the modern scientific conception of climate as a outward physical manifestation of the workings of a global system: local climates are delivered through the functioning of an intricate planetary system, a system which at a metaphorical level might even have sentience and teleology. James Lovelock's metaphor of the Earth as a self-regulating organism – as Gaia, Mother Earth – lends itself to valuing stability and order within the climate system. It is perhaps for this reason that one discourse around climate

³⁴ p. 55 in McKibbin B. (1989) *The end of nature*. Random House: London.

change views a stable climate as a public good; a view counterposed against the outcome if humans are allowed to mess with Gaia, namely climate chaos: 'This fever of global heating brought on by a plague of people is real and deadly and might already have moved outside our and the Earth's control.'³⁵

This pejorative phrase – climate chaos – has been adopted by many climate change campaigners in recent years, although it is an ironic adoption since the physical sciences have revealed that the functioning of the atmosphere is in fact naturally chaotic.³⁶ In this reading, climates – from local to global – become entities that must be stabilised for the public good, an idea enshrined in Article 2 of the UN Framework Convention on Climate Change signed in 1992: 'The ultimate objective of this Convention ... is to achieve *stabilisation* of greenhouse gas concentrations in the atmosphere' [emphasis added]. Change, dynamism and instability – foundational attributes we see evident in the natural functioning of most ecosystems – are to be resisted when discovered or created in the climate system. 'Tipping points' are the new elemental dangers that must be avoided, and (re-)stabilising global climate following the reckless interference of humans is what must be achieved at all costs.

These four examples – and there are many more that could be articulated – of how the idea of climate carries and promotes a range of ideological projections have been introduced here for just one reason; a reason that is central to this book. These examples should be enough to convince us that describing climate is about much

³⁵ p. 1 in Lovelock, J. (2006) *The revenge of Gaia*. Penguin: London.

³⁶ The late American mathematician and meteorologist Edward Lorenz (1917–2008) pioneered understanding in the early 1960s of the atmosphere as a chaotic system, publishing the first exposition of his ideas in 1963. It has since become an essential theoretical insight for all meteorological, and increasingly climatic, prediction.

more than describing some physical attribute of the planet we live on. The idea of climate exists as much in the human mind and in the matrices of cultural practices as it exists as an independent and objective physical category. The multiple meanings of climate, and the ideological freightage we load onto interpretations of climate and our interactions with it, are an essential part of making sense of what is happening around us today in our climate change discourses. Understanding climate – and hence understanding climate change – as an overly physical phenomenon too readily allows it to be appropriated uncritically in support of an expanding range of ideologies beyond the four summarised here; for example the ideologies of green colonialism, of the commodification of Nature, of national security, of celebrity culture. I am not judging whether or not any of these creeds are desirable: some may be, some may not. The more important point is that by disconnecting climate from its cultural forms – by framing climate as overtly physical and global – we allow the idea of climate change to acquire a near infinite plasticity. Detached from its cultural anchors, climate change becomes a malleable envoy enlisted in support of too many rulers.

Before we leave this chapter on the social meanings of climate, we need to observe one final important facet of the climate story, one that emerges from recognising the multiple ideologies the idea of climate can carry. This final section observes the different ways in which *changes* in climate have been used to tell stories about the rise and fall of human civilisations.

1.5 Climate in History

Changes in climate have been invoked to (help) explain the decline of civilisations more often than they have been interrogated to explain their rise. Edward Gibbon's classic account of the decline and fall of the Roman Empire was the first systematic attempt to relate climatic factors to the declining fortunes of a major civilisation. Although

only a part of his story, Gibbon depicted the confrontation between Romans and the threatening German hordes in climatic terms and also hinted at the climatic origins of the declining agricultural yields in Rome's Mediterranean bread basket, which weakened the agrarian pillar of the Empire. Gibbon's account, published in the revolutionary period between 1776 and 1788, was the first in the genre, but it is a genre that has multiplied in the following two centuries.

For Ellsworth Huntington it only took a short step from his climatic theory of racial hierarchy to arrive at a climatic basis for the shifting fortunes of the classical civilisations of the Near East, the Mediterranean and Central America. In the same 1915 book in which he 'demonstrated' the racial superiority of whites over blacks, he devoted two chapters to exploring the idea that the fate of civilisations is intimately related to changes in climate. He concluded that, 'No nation has risen to the highest grade of civilisation except in regions where the climatic stimulus is great ... a favourable climate is an essential condition of high civilisation.'³⁷ The corollary of this reasoning is that if the climatic stimulus is withdrawn or weakened, decline will inevitably follow. Huntington's intellectual legacy endured through many decades of the twentieth century, even if not always expressed quite as stridently. The British climatologist Charles Brooks echoed Huntington's logic with respect to the decline of the Indus, Mesopotamian and Egyptian civilisations in his 1926 book *Climate Through the Ages*, while Austin Miller's standard textbook *Climatology*, which went through nine editions from 1931 onwards, was still claiming in 1961 that '[civilised] power has followed the cyclonic belt in its northward retreat'³⁸

More sophisticated and nuanced arguments about the role of climate in the collapse of civilisations emerged during the 1970s. Thus Reid Bryson and Thomas Murray, in their popular study *Climates of*

³⁷ Huntington, *Civilisation and climate*, p. 270.

³⁸ p. 305 in Miller, A. A. (1961) *Climatology* (9th edn). Methuen: London.

Hunger, eschewed the broad sweeping generalisations of Huntington and Brooks in favour of detailed case studies of how sustained episodes of drought had undermined the societies of Mycenae in Greece, the First Nation Indians of the American Great Plains, and the Malian Kingdom in West Africa. Similarly detailed archaeological and palaeoclimatic work has suggested that the collapse of the Mayan civilisation around the ninth century AD was triggered by a severe drought. Archaeologist Harvey Weiss claims that 'many lines of evidence now point to climate forcing as the primary agent in repeated societal collapse'.³⁹ The recent narrative stories told by Brian Fagan⁴⁰ and Jared Diamond⁴¹ continue this tradition of seeing the hand of climate change as a significant destabilising factor for human civilisations. Diamond, for example, while not necessarily promoting a simple determinist account of human civilisations, presents climate change as one of his five factors that drive societal failure.

This discourse about the societal perils of climatic instability remains dominant. Civilisations evolve in benign environments, but through poor resource management – often exacerbated by climatic change – societal failure follows. The most extreme expression of such thinking can be found in Jim Lovelock's *Revenge of Gaia*. Lovelock sees the future survival of *all* human civilisation being dependent upon restabilising the global climate. In his view, civil structures and institutions are so intricately bound to the climate of the twentieth century that any sustained excursions from this optimal climatic state spell disaster: 'We [humans] are now so abusing the Earth that it may rise and move back to the hot state it was in 55 million years ago and if it does most of us and our descendants will die.'⁴²

³⁹ p. 610 in Weiss, H. and Bradley, R. S. (2001) What drives societal collapse? *Science* 291, 610–11.

⁴⁰ Fagan, B. (2003) *The long summer: how climate changed civilisation*. Basic Books: New York.

⁴¹ Diamond, J. (2005) *Collapse: how societies choose to fail or succeed*. Penguin: London.

⁴² Lovelock, *Revenge of Gaia*, p. 1.

Yet the historiography of climate change and civilisation has another, opposite, tone which offers a different readings. The logic of Huntington, Bryson and Diamond is inverted such that climate change acts as a stimulus for innovation and societal adaptation, a stimulus that – rather than threatening a civilisation – can accelerate the development of new complex civil and social structures. The British historian Arnold Toynbee favoured this view when he claimed in the 1930s that 'ease is inimical to civilisation ... the greater the ease of the environment, the weaker the stimulus towards civilisation'.⁴³

This contrary (and admittedly minority) reading sees civilising processes being a reaction to conditions of climatic stress and deterioration: benign or stable climates would not provoke the necessary innovation or adaptation through which new social forms come into being. Sustained regional drought and aridification, for example, rather than undermining social stability, could act as a trigger for increased social complexity associated with urbanisation and state formation.⁴⁴ This reading of the evidence also sits with more nuanced views that argue that the outcome of any given climatic shift is deeply dependent on the resilience and adaptability of local societies and institutions. There is no simple mapping between climate change and the fortunes of civilisations.

It is also worth observing that in a different context – that of human biological development – the fluctuations of climate over hundreds of thousands or millions of years have acted as evolutionary stimuli. There is substantial evidence in support of the idea that climate-driven changes in the environment over these evolutionary time-scales were responsible for hominid speciation, enlarged cranial capacity, and cultural

⁴³ Toynbee, A. J. (1934) *A study of history. Vol. II: The genesis of civilizations*. Oxford University Press.

⁴⁴ This is an argument explored in Brooks, N. (2006) Cultural responses to aridity in the Middle Holocene and increased social complexity. *Quaternary International* 151, 29–49. He cites evidence from the Near East, the Sahara, South Asia, coastal Peru and northern China in support of this position.

innovations.⁴⁵ The relationship between climate change and humanity, traced through its biological and social development, is a long one.

1.6 Summary

This chapter has introduced climate as an idea. It is an idea that can be approached using either physical or cultural pathways, but it is best understood as an idea that binds together the physical world and our cultural imagination. The idea of climate originated deep in the human past and is one around which our notions of Nature, Culture and history have formed and re-formed. Climate is therefore not just an abstract idea, but also a somewhat elusive one; a bit like 'goodness' – easier to recognise than to define.

Four themes have been introduced in this chapter, echoes of which will be found later in the book as we examine why we disagree about climate change. The first theme is that climates have both physical reality and cultural meaning. Indeed, the idea of climate can only be fully understood if one allows these physical and cultural dimensions to interact and mutually shape each other. Treating climate purely as a physical entity, accessible solely through natural science or, conversely, allowing the cultural symbolism of climate to be detached from any physical anchors, denies something essential about the idea of climate. Following from this is the second theme – climate is frequently used to carry and to convey a variety of ideological assumptions and projections. This ideological baggage may not always be obvious at first sight. The examples given in this chapter show how climate has been used to support, *inter alia*, the ideologies of racism, the human mastery of Nature, the sanctity of a pristine Nature, and the preference for stability over change. The idea of climate, transcending the physical and the cultural but drawing substance from both, lends

⁴⁵ These arguments are summarised in Behrensmeyer, A. K. (2006) Climate change and human evolution. *Science* 311, 476. To this list of events she adds the morphological shift to bipedality, behavioural adaptability and intercontinental migration.

itself to such multiple, layered, and sometimes contradictory readings. The third theme is that climates change over time – both the physical climates of places, but also the ideologies with which climate is associated. Climate may change because its physical attributes change or because its cultural symbolism changes, or both.

And finally, we need to recognise that the ways in which the story of climate change and human civilisation has been told have also changed over time. The dominant trope in this story has been one of climate change as threat, and yet dissenting voices have emerged which emphasise the creative potential for societies that can be found through changes in climate. ~~We cannot detach the stories we tell about climate from the stories we tell about societies.~~ And if this is true for climate, then it holds additional truth in relation to climate change: 'How [and why] climate change matters will always depend upon how society has evolved and continues to evolve, just as will the significance of those aspects of climate that remain the same.'⁴⁶ Disagreements about climate change are as likely to reveal conflicts within and between societies about the ideologies that we carry and promote, as they are to be rooted in contrary readings of the scientific evidence that humans are implicated in physical climate change.

We next need to examine what this evidence is and how it has emerged over the last 150 years. This will be our task in Chapter 2: *The Discovery of Climate Change*.

FURTHER READING FOR CHAPTER 1

Boia, L. (2005) *The weather in the imagination*. Reaktion Books: London. Written by a Romanian historian, this delightful book traces the cultural history of the idea of weather and climate from the Greeks to the present day. The idea of climate and climate change has appeared in religion, in science, in society and in politics in different ways and at different times. Lucien Boia argues that the imaginative role of the mind is as important as the physical experience of the body.

⁴⁶ Meyer, *Americans and their weather*, p. 213.

Glacken, C. (1967) **Traces on a Rhodian Shore: nature and culture in Western thought from ancient times to the end of the eighteenth century.** University of California Press: Berkeley, CA.

Clarence Glacken's monumental survey of the history of Nature and Culture in Western thought from ancient times to the end of the eighteenth century has become a classic. No subsequent cultural history of Nature can fail to acknowledge the ideas introduced by Glacken; and no environmental history can ignore them.

Golinski, J. (2007) **British weather and the climate of enlightenment.** University of Chicago Press.

Written as a cultural history of science, Jan Golinski's book shows that the way the British related to their weather was influenced by the intellectual ideas of the Enlightenment and the changing practices of science and changing social order during the eighteenth century. In particular, a new sense of national climate emerged as weather was first measured and then analysed in new quantitative ways.

Huntington, E. (2001) **Civilisation and climate** (reprinted from the 1915 edition). University Press of the Pacific: Honolulu, HI.

This book is a classic of its time, a systematic examination of the evidence for the climate determinist outlook. Ellsworth Huntington draws together empirical evidence and an ideological reading of empire and history to paint a picture in which individual, racial and social characteristics are heavily shaped, if not controlled, by climatic factors.

Lamb, H. H. (1982) **Climate, history and the modern world.** Methuen: London.

British climatologist Hubert Lamb gathers much of his life's work and thinking into this book, in which he tells the story of why climate change on human time-scales matters. He moves from the earliest civilisations through to the twentieth century, exploring the changing relationship between physical climates and human societies.

Meyer, W. B. (2000) **Americans and their weather.** Oxford University Press.

William Meyer is a cultural geographer who surveys the multiple ways in which the American people from the seventeenth century onwards have made sense of their weather. He shows that what weather means to Americans has always been a function of culture, technology, economics and even politics.

Strauss, S. and Orlove, B. (eds) (2003) **Weather, climate, culture.** Berg: Oxford.

An edited book comprising fifteen chapters in which anthropologists, historians and geographers explore the different ways in which societies in history and around the world have related to aspects of weather and climate. Examples are included from Brazil, England, Iceland, Switzerland and Tanzania.

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