



Global Histories of Empire and Climate in the Anthropocene

Journal:	<i>History Compass</i>
Manuscript ID	HICO-1341.R2
Wiley - Manuscript type:	Article
Keywords:	climate < Key Topics, Imperial, Colonial and Postcolonial History < History < Subjects, imperialism < Key Topics, World < Compass Sections, Environmental History < History < Subjects, Historiography < Study of History < History < Subjects, capitalism < Key Topics, colonialism < Key Topics, ecology < Key Topics, industrialization < Key Topics

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Abstract

The scientific consensus on the causes of climate change has galvanised global history in the Anthropocene. Within this expanding subfield, however, many historians have afforded imperialism too little explanatory power. This reticence is partly attributable to the intellectual formation of the discipline itself, which long severed human from natural history. It is also due to the paleo-biological scale of climate change and the related propagation of ‘species history’ by Dipesh Chakrabarty. Obscuring global asymmetries in responsibility for climate change, this approach has deflected attention from the intersections of imperialism and environmental degradation. This article surveys the historiography and methodological challenges of climate change, Chakrabarty’s influence on Anthropocene scholarship, and critical responses by global historians. It also summarises recent global histories which have closely analysed the interconnections between empire and climate change, indicating a tipping point in global environmental historiography. These studies reveal intimate, necessarily *longue durée* linkages between the industrialisation, fossil-fuel combustion, and exploitative socio-political structures underpinning both imperialism and climate change.

Key words: climate change; empire; global history; species history; environmental history; Anthropocene

Main Text

The scientific consensus on the causes of climate change has galvanised global history in the Anthropocene, with some practitioners asserting that global warming has ‘motivated the recent initiative to write global history’ (Robin and Steffen, 2007). Within this expanding subfield, however, many historians have afforded imperialism too little explanatory power. This

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3 reticence is partly attributable to the intellectual formation of the historical discipline itself,
4 which long severed human from natural history. It is also due to the paleo-biological scale of
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6 climate change and the related propagation of ‘species history’ by postcolonial historian Dipesh
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8 Chakrabarty. Reorienting the concepts and methods of global history for the Anthropocene,
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10 Chakrabarty’s approach has deflected attention from the intersections of imperialism and
11
12 environmental degradation (Chakrabarty, 2009, 2018). Indeed, Chakrabarty has dismissed this
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14 nexus as irrelevant (Chakrabarty, 2009, 2015a). Given the global ‘patriotism’ demanded by
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16 climate change, interdisciplinary academics urge historians and scientists to collaborate on
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18 universal ‘species histories’ (Robin and Steffen, 2007). This undifferentiated approach
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20 obscures global asymmetries in responsibility for climate change. Recently, global historians
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22 have closely analysed the interconnections between empire and climate change, indicating a
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24 tipping point in global environmental historiography (Brooke, 2014; Ross, 2017).
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33 This article briefly surveys the historiography of climate change; the meaning of the
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35 Anthropocene; Chakrabarty’s theses, their influence on Anthropocene scholarship, and critical
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37 responses by global historians. It also considers how historians have addressed the
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39 methodological challenges posed by climate change by considering the role of imperialism
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41 through the concepts and themes of global history. Empire, along with its associated ideologies
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43 and practices, is a crucial lens through which to analyse the global history of climate change in
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45 the Anthropocene. Drawing together many of the key concepts and themes of global history,
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47 imperial history enables historians to explore the asymmetric causes and consequences of
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49 climate change.
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56 For the purposes of this article, imperialism is defined as ‘a form of domination imposed by
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58 one society over another in which the two are incorporated in a differentiated hierarchy that
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60 works to the advantage of the dominant party’ (Ross, 2017). Heeding Linda Colley’s warning

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3 that the boundary between nation states and empires can be ‘porous and unstable’, this broad
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5 definition recognises various historical permutations of empire. To ‘speak truth unto power—
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7 power in the present and not simply in the past’ (Colley, 2006), historians must examine all
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9 forms of empire as they are connected to the present crises arising from the climatic volatility
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11 caused by anthropogenic greenhouse gases and the attendant increase in global average
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13 temperatures (hereafter, simply ‘climate change’ or ‘global warming’). It is worth noting at the
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15 outset that climate change as presently experienced and theorised can be traced back to the
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17 origins of capitalism in the sixteenth century (Bonneuil and Fressoz, 2015). This nexus between
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19 capitalism and climate change is often rehearsed. However, empire is a modality of capitalism,
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21 perhaps the superlative modality (Luxemburg, 1913). This article therefore argues that
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23 historians should sharpen our attention to how this modality enabled the planetary expansion
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25 of capitalism, and thus, how empire laid the infrastructure for the uneven distribution of the
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27 pleasure and pain of a fossil-fuelled global economy (Malm and Zetkin Collective, 2021).
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29 Primarily analysing historical studies tracing the causes of climate change to imperialism, this
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31 article advocates for further research on how imperialism has shaped the impacts of climate
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33 change and coping mechanisms in the Anthropocene.
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42 Despite scientific consensus over the origins of global warming (Weart, 2003; IPCC, 2018),
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44 and centuries of ‘environmental reflexivity’ in which humankind was ‘saturated’ with
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46 ‘profound worries over human impacts on the climate’ (Locher and Fressoz, 2012), historians
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48 have been slow to recognise the challenge that climate change presents to global history. Many
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50 historians attribute this to a longstanding disciplinary ‘blind spot’: the severance of human
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52 history from natural history. From the mid-nineteenth century, as history professionalised, the
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54 ‘climatic paradigm’ for understanding the world collapsed (Thomas, 2017). No longer ‘an
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56 adaptable matrix of both human and natural changes’, climate became a fixed framework that
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58 determined the conditions for human development (Locher and Fressoz, 2012). The Annales
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3 school might be taken to have cemented this divorce between human and environmental
4 history. One of the most influential historiographical traditions of the twentieth century, the
5 Annales school rejected the traditional paradigm of *histoire événementielle* ('event history') in
6 favour of analysing the history of structures (Burke, 1991). Although the Annalistes took
7 material life seriously, they also portrayed climate as an almost immutable framework over the
8 *longue durée*, a factor separate from human agency (Burke, 1991). Fernand Braudel, for
9 example, referred to the 'almost timeless' character of 'man's relationship to the environment'
10 and described 'a will exogenous to man' determining 'climatic variations' (Braudel, 1986).
11 Thus, until the 1970s, professional historians displayed negligible interest in environmental
12 history. The discipline still bears vestigial traces of its intellectual formation, with many
13 historians retaining a 'blind spot' regarding climate change (Thomas, 2017; Chakrabarty,
14 2021). While the environmental history of empire has attracted considerable attention over the
15 last two decades, this coverage is 'highly uneven' (Ross, 2017). Indeed, the last decade has
16 seen the publication of global histories with perfunctory references to climate change (Beinart
17 and Hughes, 2007; Dukes, 2011; Hunt, 2014). The role of imperialism in remoulding the
18 biosphere has been well-studied, particularly through vectors such as the inter-continental
19 transfer of organisms and the imperial origins of conservationism (Crosby, 1972, 1986; Grove,
20 1995; Griffiths and Robin, 1998; Drayton, 2000). However, the relationship between
21 imperialism and environmental change since the late nineteenth century has been studied only
22 in a 'piecemeal fashion' (Ross, 2017). Indeed, Sam White lamented in a 'state of the field'
23 report that in both public discourse and 'academic communities, climate and history rarely mix.
24 Despite recent progress, the subject remains a small specialty among environmental historians'
25 (White, 2012b).

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Environmental historians and historical geographers have tended to study natural climate
change in the distant past (White, 2012a; Morgan, 2018). However, with remarkable exceptions

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3 (Fleming, 1998; Carey, 2010; Beattie, O’Gorman and Henry, 2014; Allan et al, 2016), there
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5 are few studies on the history of contemporary anthropogenic climate change (Carey, 2012;
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7 Das, 2018). While there are compelling analyses of, for example, the intellectual history of
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9 climatology (Heymann, 2010; Coen, 2011), and meteorology and empire (Anderson, 2005;
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11 Cushman, 2013), many of these studies examine unilateral dynamics. The latter works analyse,
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13 for example, Western environmental anxieties, or how Western climate discourses were used
14
15 to justify colonialism and racism, without analysing how colonialism or imperialism impacted
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17 on climate and environment (Beattie, 2003; Carey, 2012). Meanwhile, archaeologists have
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19 promoted ‘an explicit study of archaeologies of empire and environment,’ advancing theories
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21 and methods that demonstrate how environmental practices articulate people’s relationships to
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23 imperial authority (Rosenzweig and Marston, 2018); and analysing empires as ‘ecosystem
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25 engineers’ (Morrison, 2018a). Increasingly, the historically intersecting tales of climate and
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27 imperialism are being rigorously told or methodologically set up for future study (Endfield and
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29 Randalls, 2014; Mahony and Endfield, 2018). This important research agenda must continue.
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38 Any analysis of the historiography of imperialism and climate change must engage with
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40 Immanuel Wallerstein, whose world-systems theory is foundational to contemporary analyses
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42 of global environmental history. A macro-sociological perspective seeking to explain the
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44 capitalist world economy as a ‘total social system’ (Wallerstein, 1974, 2004), Wallerstein’s
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46 work on world-system analysis is invaluable for studying climate change precisely ‘because it
47
48 is capable of linking a given organisation of a world-system ... with an ensuing social and
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50 ecological footprint’ (Viñuales, 2018). Indeed, Jason Moore credits Wallerstein with
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52 formulating ‘the embryo of an ecological theory of imperialism’, dialectically linking the social
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54 organization of world-economy and world-ecology (Moore, 2003). Following Wallerstein,
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56 rigorous analyses have been undertaken in dialogue between global history of world-systems
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58 and associated global ecological changes (Pomeranz, 2000; Hornborg, McNeill and Martinez-
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3 Alier, 2007; Bonneuil and Fressoz, 2017). Unfortunately, however, such analyses rarely trace
4 any nexus between imperialist modes of production and climactic climatic change.
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10 Andre Gunder Frank's dependency theory also informs the intellectual lineage of
11 contemporary scholars of the Anthropocene. Through studying the 'constellations of
12 metropolises and satellites' constituting the international economic system, Frank argues we can
13 understand past and ongoing tendencies in the world capitalist structure which 'lead to the
14 development of the metropolis and the underdevelopment of the satellite' (Frank, 1970). As
15 the climate crisis escalates, Frank's notion of sacrificial zones—those satellites sacrificed to
16 the development of metropolitan economies (Frank, 1970; Rodney, 1972)—might be
17 powerfully analogised with climate-related 'sacrificial zones'.
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30 Moore has also been a powerful voice in the study of early modern empires and their
31 environmental impacts, widening out into an understanding of empire as the foundational
32 driver of the 'Capitalocene', rather than the Anthropocene (Moore, 2015). Yet Moore has
33 registered surprise that 'for all the discussions of "ecological imperialism" ... within the world-
34 historical perspective, there has been little serious pursuit of this line of thinking' (Moore,
35 2003). It took years for scholars to start producing sustained analyses in this subfield.
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46 The engagement of global historians with climate change parallels the popular global response.
47 On many registers—socio-cultural, political, legal, economic—the global response has been
48 disproportionate to the gravity of the scientific data and projections. Many explanations have
49 been proposed for this restraint, including the categorization of climate change as what
50 philosopher Timothy Morton calls 'hyperobjects', or entities of such vast temporal and spatial
51 dimensions that they present 'scalar dilemmas' which paralyze our ways of thinking about the
52 world (Morton, 2013; Vanderheiden, 2008). Beyond disciplinary traditions, it is possible that
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3 global historians, too, have been intimidated by the overwhelming spatio-temporal scales of
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5 climate change (Conrad, 2016).
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10 *What is the Anthropocene?*

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14 In 2000, the scientists Eugene Stoermer and Paul Crutzen proposed a new geological epoch, in
15
16 which humankind is exerting ‘a profound and novel effect on the earth’s ecosystems’,
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18 biodiversity, and atmosphere (Crutzen and Stoermer, 2000). Despite myriad interpretations and
19
20 contested chronologies, the Anthropocene essentially means a period in which humans have
21
22 become ‘geological agents, changing the most basic physical processes of the Earth’
23
24 (Chakrabarty, 2009). Although not yet formally ratified as a geological epoch, the
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26 environmental markers of the Anthropocene include climate change, biosphere degradation,
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28 and biodiversity loss (Viñuales, 2018).
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35 Both the concept and chronology of the Anthropocene are much debated amongst biophysical
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37 and social scientists. Crutzen asserted that the Anthropocene coincided with James Watt’s
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39 invention of the steam engine in 1784 (Crutzen, 2002), a theory that sees the Anthropocene
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41 coinciding with the Industrial Revolution and intensifying during the post-1945 Great
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43 Acceleration (Steffen, Crutzen and McNeill, 2007). Certain scientists, including the
44
45 Anthropocene Working Group, date this geological epoch from the mid-twentieth century,
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47 coinciding with the advent of nuclear power and the massive expansion in use of fossil fuels
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49 and synthetic fertilisers (Bonneuil and Fressoz, 2017). Others assert that it commenced with
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51 the development of agriculture, some 7,000 to 8,000 years ago (Ruddiman, 2003). Drawing
52
53 explicit connections between imperialism and climate change, Simon Lewis and Mark Maslin
54
55 propose that the Anthropocene commenced in 1610, when the first global impacts of the
56
57 Columbian Exchange became visible (Lewis and Maslin, 2015, 2018). Their chronology
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3 depicts the Anthropocene and climate change as ‘intrinsically linked’ to ‘a deeply
4 uncomfortable story of colonialism, slavery and the birth of a profit-driven capitalist mode of
5 living’ (Lewis and Maslin, 2018). Jeremy Davies agrees that the Columbian exchange—that
6 ‘ecological fusion of Afro-Eurasia and the Americas’ across first the Atlantic and then the
7 Pacific Ocean—offers more compelling candidates for the Anthropocene’s ‘golden spike’.
8 However, arguing it would be a mistake to over-emphasise the salience of 1492, Davies thus
9 suggests that historians ought to think about a long ‘end-of-Holocene’ transitional phase
10 starting with empire-building around 1500 (Davies, 2016). Archaeologists have done
11 invaluable work towards periodizing the human transformation of the global biosphere (Ellis,
12 Fuller, Kaplan and Lutters, 2013; Boivin et al, 2016; Bauer and Ellis, 2018). A fundamental
13 question of scale for global historians, the dating of the Anthropocene tends to determine
14 attribution of responsibility for climate change.

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17 Libby Robin has emphasised the Eurocentrism of these popular genesis stories, which ‘follow
18 the deep wheel ruts of northern hemisphere history’ by focusing on ‘key Old-World nodes’:
19 the Pleistocene extinctions, agricultural and industrial revolutions. This contradicts the
20 fundamental idea of the Anthropocene, namely, ‘that people have made *global* changes,
21 changes at global scales, and to systems with a global reach’ (Robin, 2013). Several edited
22 collections have recently been published as correctives to the perceived Eurocentrism and
23 Western triumphalism of Anthropocene histories (Hornborg, McNeill and Martinez-Alier,
24 2007; Austin, 2017; Morrison, 2018b).

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27 The Anthropocene has generated a considerable body of literature, theorising how climate
28 change is affecting human life and scholarship. An inherently interdisciplinary, transnational
29 field, this scholarship blends environmental history, economic history, postcolonial theory,
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3 biophysical and geological science, and human ecology. Within this expanding subfield of
4 global history, Chakrabarty is one of the most influential voices.
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10 *Chakrabarty's Theses*

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14 In his influential article, 'The Climate of History: Four Theses', Chakrabarty concludes that
15 the Anthropocene demands profound transformations not only in the way human beings live,
16 but also in how we conceive of and write history (Chakrabarty, 2009). His fundamental thesis
17 is that 'anthropogenic explanations of climate change spell the collapse of the age-old humanist
18 distinction between natural history and human history'. Historians, like climate scientists, must
19 collapse this false binary and 'scale up our imagination of the human'. This means recognising
20 human beings as geological agents of history, collectively acting as a 'force of nature', and
21 rethinking the analytic strategies and theories of postcolonial history.
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34 Arguing that the Anthropocene 'severely qualifies humanist histories of
35 modernity/globalization', Chakrabarty therefore proposes that 'the Anthropocene requires us
36 to put global histories of capital [understood as processes of industrialisation and globalisation]
37 in conversation with the species history of humans' (Chakrabarty, 2009). Without the deep
38 history of 'species thinking', he argues, it would be difficult to understand why climate change
39 constitutes a crisis for humans. Chakrabarty urges historians to study the collective *anthropos*,
40 rather than the *homo*, or 'humanity as a divided political subject', because the *anthropos*
41 'decentres the human by subordinating human history to the geological and evolutionary
42 histories of the planet' (Chakrabarty, 2015b). Although many agree that the deep history scale
43 is indispensable for understanding climate change (Brooke, 2014; Conrad, 2016), this 'species
44 thinking' or 'universalizing spirit' has proved the most controversial of Chakrabarty's theses.
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3 Chakrabarty has acknowledged possible objections to such all-inclusive terms ('species',
4 'humanity'), as these categories flatten global disparities in contributions to climate change
5 and obscure how the human forces contributing to global warming form 'part of a larger story':
6 the emergence of capitalism in the West and its 'imperial or quasi-imperial domination' of the
7 rest of the world (Chakrabarty, 2009). He also admits that the climate crisis is fundamentally
8 'the product of a social rift: the domination of human being by human being' (Chakrabarty,
9 2015a). Despite these concessions, Chakrabarty argues that 'climate change is not inherently—
10 or logically—a problem of past or accumulated intra-human justice', specifically asserting that
11 'historical inequalities' stemming from 'histories of modern European expansion and empires'
12 are irrelevant in explaining the origins of the Anthropocene. Such a reductive view of the
13 problem of climate change 'only blinds us to the nature of our present', which demands
14 reduction of total emissions (Chakrabarty, 2015a-b). Historians, therefore, cannot exonerate
15 the Global South from climate culpability in this 'shared catastrophe' (Chakrabarty, 2009).

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35 In a new addendum to 'Four Theses', Chakrabarty defensively glosses his use of universalizing
36 categories (Chakrabarty, 2021), continuing to champion the analytical and ethical imperative
37 of 'species history' because of its potential to transcend identitarian politics through a sense of
38 collective responsibility and solidarity (Chakrabarty, 2015a-b). Similarly, the interdisciplinary
39 project, Integrated History and Future of People on Earth (IHOPE), aims to write 'a new global
40 history' that advances 'human co-operation in the interests of the planet' by integrating
41 biophysical and human histories over thousands of millennia. Hoping to instil 'a new idea of
42 "patriotism", a loyalty not to country but to Earth', IHOPE produces history 'on a very different
43 scale, and with rather different questions from "world history"' (Robin and Steffen, 2007). This
44 project attributes climate change to macro-level phenomena, without studying micro-level
45 agencies (Bonneuil and Fressoz, 2017). The motive—spurring global thinking and collective
46 action on the necessary scale—is understandable. However, this over-globalised,
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3 undifferentiated approach precludes clear analysis of technoeconomic or socio-political
4 systems, or historical asymmetries in responsibility for climate change.
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10 *Critiques of Chakrabarty's Theses*

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14 An important critique of both the Anthropocene narrative and Chakrabarty's 'species-history'
15 problematises their false universalism. The main problems with adopting 'humanity' as the
16 analytical unit of global history are that this monolithic category: (i) cannot capture important
17 intra-species inequalities among the human variable of climate change; (ii) masks the higher
18 responsibility of early industrialised countries and their elites in fuelling the Anthropocene;
19 and (iii) obscures disparities between those who have benefited from the results of carbon-
20 intensive technology and those who have suffered its adverse effects (Bonneuil and Fressoz,
21 2017; Viñuales, 2018; Conrad, 2016). Some academics thus denounce the 'planetary analytic'
22 of the Anthropocene for its erasure of histories of racism, slavery, and violent dispossession
23 (Yusoff, 2018). In a resolute critique of Chakrabarty's work, Ian Baucom combines black
24 studies with climate change, outlining how critical race, diaspora, and postcolonial studies are
25 crucial to understanding the Anthropocene (Baucom, 2020). Pasifika scholars have described
26 this inattention to differentiated climate burdens and historical responsibility as comparable to
27 'former colonies in Oceania being colonised a second time' (Hereniko, 2014).
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49 Sebastian Conrad acknowledges that approaching the Anthropocene on a paleo-biological
50 scale—the long view preferred by Chakrabarty and IHOPE—is heuristically useful, as it
51 indicates 'the urgency of ecological protection.' However, this vast timeframe and the category
52 of 'species' prevents global historians from addressing questions of responsibility, both past
53 and present. Writing history on a scale of 'undifferentiated "humanity"', Conrad warns, may
54 blind historians to 'the forces—such as capitalism and imperialism—that have impacted the
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3 world around us'. To write comprehensive histories of climate change, historians must assess
4 causality at both macro- and micro-levels: assessing aggregate causality alongside the agency
5 and impact of different groups (Conrad, 2016). Global historians must transcend universalised
6 conceptions of humanity, disconnected from the socio-political structures which have enabled
7 the ever-accelerating economic growth, consumption, and emissions of the Anthropocene.
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17 Christophe Bonneuil and Jean-Baptiste Fressoz argue that Chakrabarty's 'all-inclusive view of
18 humanity' is a regression from decades of historiographical developments, which 'should not
19 be overlooked in the name of ecological emergency'. They reject Chakrabarty's approach for
20 obscuring the 'mechanisms of domination' underlying the extractive industrial development
21 model that has altered the planet's geological trajectory. Accordingly, Bonneuil and Fressoz
22 argue that historians should write about the 'Capitalocene' instead of the Anthropocene, as this
23 term better reflects how climate change is 'inseparable from the history of capitalist world-
24 systems, of unequal ecological exchange, of colonialism and imperialism' (2017).
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38 Andreas Malm and Alf Hornborg criticise 'species history' on similar bases, noting that the
39 Anthropocene narrative obscures the fact that the fossil economy was neither created nor
40 perpetuated by humankind in general, but only by part of it (Malm and Hornborg, 2014). The
41 industrialisation precipitating the Anthropocene could not have occurred without 'systematic
42 unequal ecological exchange with dominated/peripheral regions of the "world-system".'
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49 Scrutinising the transition to fossil fuels in late eighteenth-century Britain, Hornborg concludes
50 that climate change was spurred by the 'highly inequitable global processes' of colonialism
51 and slavery (Hornborg, 2015). While Malm endorses the 'Capitalocene' ('the geology not of
52 mankind but of capital accumulation'), Hornborg proposes 'Technocene', a moniker revealing
53 how globalised technology enables domination (Malm, 2016, 2020; Hornborg, 2015).
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3 This is more than a battle of neologisms, for embedded within these terms—Anthropocene,
4 Capitalocene, Technocene—are theories of causality and responsibility, which impact both the
5 scale and methodology of global histories of climate change, and contemporary political
6 appetites and possibilities (Conrad, 2016). Ignorance of these intra-human disparities will
7 impact any attempts to address the climate crisis (Viñuales, 2018). Having conducted his own
8 forensic investigation into this globally lethal whodunnit, Malm concludes that the fossil
9 economy is ‘a distinctly British invention’: ‘an economy of self-sustaining growth predicated
10 on the growing consumption of fossil fuels and therefore generating a sustained growth in CO₂
11 emissions’. Drawing explicit causal connections between the fossil economy and imperial
12 expansion, Malm notes that the British Empire fuelled its steamboats with coal, and thus relied
13 on the fossil economy ‘to extend its control over territories and accelerate its appropriation of
14 resources from around the world’ (Malm, 2018). Tracing these causalities is important, for
15 once we identify the ‘very peculiar human history’ of large-scale fossil fuel combustion, we
16 realise both its contingency and possible discontinuity. Aiming to make ‘space for action and
17 resistance’, Malm urges that ‘any theory for the warming condition should have the struggle to
18 stabilise climate’ as its ‘practical, if only ideal, point of reference’ (Malm, 2018).

41 42 *Differentiated Global Histories*

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47 To master the empirical data and multi-scalar nature of climate change, many academics have
48 argued that historians need renewed concepts and methodologies (Chakrabarty, 2009;
49 Viñuales, 2018; Thomas, 2017). Within existing analytical frameworks, however, global
50 historians have demonstrated that the discipline is well-equipped to assess the complex role of
51 imperialism in causing and intensifying climate change.
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3 Within the Great Divergence debate, the California School's contributions to global
4 historiography have suggested that historical contingency, rather than biological or
5 environmental determinism, played a major role in shaping the type of world-systems capable
6 of explaining both: (a) the origins of the Industrial Revolution and modern economic growth
7 in the United Kingdom and western Europe; and (b) the disparities between countries in terms
8 of historical responsibility for and exposure to the risks of the Anthropocene (Viñuales, 2018).
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10 Strongly associated with Kenneth Pomeranz's influential text, *The Great Divergence* (2000),
11 the California School upended the orthodox account of 'the rise of the West' as an essentially
12 European process of economic transformation by identifying 'surprising resemblances'
13 between the most advanced economies of Eurasia (Vanhaute, 2019). The California School
14 argues that the Industrial Revolution occurred in Europe not because of institutional or cultural
15 differences, but due to the continent's privileged access to coal and colonies: the 'two crucial
16 discontinuities' enabling it to transcend the organic constraints on growth which thwarted other
17 regions. Enabled by mineral endowments and distant dominions, western Europe became 'a
18 fortunate freak' of self-sustaining economic growth (Pomeranz, 2000; Allen, 2011).
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40 The present issue is not the explanatory power of Pomeranz' thesis (see Vanhaute, 2019; Vries,
41 2010, 2013), but the need for global historians to study certain contingencies—such as coal
42 reserves and asymmetric imperial trade—to explain 'the emergence of the thermo-industrial
43 revolution that prompted the Anthropocene.' These asymmetries highlight that it was not all of
44 humankind that drove (or benefited from) the industrial processes underpinning the
45 Anthropocene, but only a highly privileged portion. To capture these disparities, global
46 historians require 'an analytical approach with much higher resolution' than that proposed by
47 Chakrabarty (Viñuales, 2018).
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3 This finer-grained analysis is precisely what John Brooke provides in *Climate Change and the*
4 *Course of Global History*. Exploring the role of natural history in human history, Brooke
5
6 concludes that global empire-building was ‘a critical force in the spiralling development of
7
8 economic modernity’ (Brooke, 2014). Brooke addresses the role of coal and colonies in
9
10 kickstarting the Industrial Revolution, and the primary sources of greenhouse gas emissions
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12 throughout human history. Excepting Chinese rice production, Brooke shows that nineteenth
13
14 century land-use emissions were all intimately tied to ‘settler-imperial expansions into the
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16 tropical and temperate biospheres.’ Setting masses of climate data into historical context,
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18 Brooke also notes that these datasets suggest industrial emissions in the United States matched
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20 land-use emissions until around 1910 and began to surge beyond them in 1945. This aligns, of
21
22 course, with the ‘Great Acceleration’ theory of the Anthropocene. Meanwhile, tropical
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24 emissions were driven by the expansionist, extractivist tactics of ‘empire and global markets’,
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26 as the major European powers divided the world amongst themselves, conquered huge new
27
28 territories in Africa, Southeast Asia, and Latin America, and then forced monocrop production
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30 onto those territories. Since the Second Industrial Revolution, ‘the demands of growing
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32 urbanized populations around the North Atlantic’—extracting resources ‘from formal and
33
34 informal empires’ and ratcheting up trade and production—have been ‘the central dynamic
35
36 forces for the global transformation of the past century and a half’. Thus, Brooke concludes,
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38 the modern ‘trajectory toward state, empire, and the fossil fuel transformation’ explains ‘the
39
40 central [climatic] problems of our human condition’ (Brooke, 2014).
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51 Charting imperial networks of export trade, Brooke also synthesises the classic studies showing
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53 how demand for specific varieties of cotton cloth—the raw materials for which were based on
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55 slave labour—stimulated the mid-eighteenth-century transition to water-powered
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57 mechanisation of spinning (Brooke, 2014; Inikori, 2002). Moreover, Malm notes how fossil
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59 fuels offered an on-demand and thus more effective energy source in the exploitation of
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3 industrial labour, despite waterpower's relative abundance (Malm, 2016). Brooke and Malm
4 thus trace a direct link between empire, capitalism, and manufacturing emissions. Brooke also
5 highlights the global emissions imbalance, whereby developing countries of the Global South
6 have contributed far less to climate change than developed countries (with certain areas—for
7 example, tropical Africa—even acting as carbon sinks), and yet are far more likely to
8 experience the worst of climatic crises, and sooner (Brooke, 2014; McNeill and Engelke,
9 2014). Contrary to the homogenised Anthropocene narrative, Brooke shows that the inequities
10 of climate change mirror those of the international division of labour consolidated during the
11 Great Divergence.
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26 Malm likewise uses the concept of the Great Divergence to analyse the nexus between
27 imperialism and climate change, emphasising the physical violence which propelled the two
28 processes. Summarising his forthcoming text, *Fossil Empire*, Malm explores how the British
29 Empire deployed steam power to 'subjugate and integrate the peripheries' of the nineteenth
30 century world economy (Malm, 2017). Powering machinery and steamboats, steam technology
31 enabled the British Empire to under-develop and de-industrialise colonial peripheries, to
32 appropriate their labour and the land from which biophysical resources emerged, generating
33 both the climate crisis and geopolitical inequities. This fossil-fuelled violence 'helped to
34 engender the modern division of labour between an industrially developed core and raw
35 materials-supplying peripheries.' As the British Empire globalised the fossil economy, these
36 'brutal dynamics' also generated CO₂ emissions causing climate change, patterns subsequently
37 replicated by decolonizing and so-called postcolonial nations (Malm, 2017).
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56 Linking orthodox imperialism to the neo-imperialist methods and mindsets of fossil fuel
57 companies, Malm also describes ExxonMobil's swathe of global 'imperialist ventures'. This
58 argument draws upon Steve Coll's explanation of Exxon's business-model: because Exxon
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3 needed to drill holes in the ground and then operate its oil and gas wells, ‘its business
4 imperatives were linked to the control of physical territories’ (Coll, 2012). Revealing
5 imperialism as ‘a necessary imperative of this corporation’, Malm notes that this corporate
6 modus operandi ‘recreates’ aspects of the British Empire’s fossil economy ‘on a global scale’
7 (Malm, 2018).
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17 Simon Pirani’s global history of fossil fuel consumption similarly observes that fossil fuels are
18 ‘consumed not by undifferentiated humanity, but by people living in, and divided by ...
19 unequal social and economic systems’, such as empires (Pirani, 2018). Global supply chains
20 of coal and oil—networks constructed through imperial capitalism—supercharged imperial
21 expansion from the mid-nineteenth century, locking in energy-intensive technologies,
22 industries and consumption patterns leading to the current climate crisis (Klein, 2015; Pirani,
23 2018).
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35 In *Ecology and Power in the Age of Empire*, Corey Ross offers a panoptic environmental
36 history of late nineteenth and twentieth century European imperialism, ‘relating the expansion
37 of modern empire, global trade, and mass consumption to the momentous ecological shifts they
38 entailed’, including global warming (Ross, 2017). While concluding that modern imperial
39 expansion ‘drove far-reaching ecological change on a global scale’, Ross rejects a monocausal
40 explanation of ‘inexorable degradation at the hands of imperialists’, instead highlighting the
41 multidimensionality of the changes that occurred, including how environmental outcomes were
42 also determined by continuities with pre-colonial land use, indigenous agency, and material
43 factors. He likens the ‘socio-ecological project of imperialism’ to ‘a franchise venture’ that
44 often acquired the active participation of subject peoples’, such as the Ashanti cocoa farmer or
45 Sumatran rubber smallholder. Consequently, historians must examine the ‘biophysical
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3 dimensions of the imperial past' while recognising 'the agency of colonial subjects alongside
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5 Europeans in building the ecological order of modern imperialism'.
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10 Cognisant of 'the racial and social specificities of European colonialism', Ross concludes that
11
12 in most regions, imperialism did not initiate 'anthropogenic change so much as perpetuate and
13
14 often magnify existing strategies of human use'. Despite these continuities with pre-colonial
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16 modes of extraction, the extent of anthropogenic environmental change since the nineteenth
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18 century indicates that 'modern imperialism marked a decisive and largely negative milestone
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20 for the ecosystems of the colonial world'.
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26 Ross also reflects on the environmental legacies of imperial trade structures, institutional
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28 arrangements and resource management practices following formal decolonization.
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30 Ultimately, he concludes that the superlative environmental legacy of European imperialism
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32 was its 'colonial attitude towards nature': an obsession with mastery of the biophysical
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34 environment and belief in perpetual economic growth which justified both extractivism and
35
36 domination of those 'less capable of controlling the world around them.' Ross describes this
37
38 'ideological holdover' as 'profoundly inappropriate—even dangerous' in the twenty-first
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40 century (Ross, 2017). Influential global and imperial historians have denounced a scholarly
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42 focus on the epistemic violence of empire, arguing that this obscures 'real', physical violence
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44 (Drayton, 2011; Kennedy, 2015). However, using the concepts of the Great Divergence,
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46 postcolonial theory, and 'climatic orientalism' (Locher and Fressoz, 2012), Ross and other
47
48 historians have analysed these dovetailing forms of violence—epistemic and physical—as
49
50 mutually reinforcing within the history of empire and climate change (Radkau, 2008; Klein,
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52 2015, 2019; Ross, 2017).
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3 Utilising core concepts of global history, Ross has written ‘a much messier but also a much
4 richer history’ of empire and environmental (including climate) change. He acknowledges that
5 this ‘interpretative messiness’ will not be universally compelling, especially given ‘the
6 environmental turbulences and injustices at stake’. However, rather than absolving the agents
7 of European imperialism from responsibility for these environmental transformations, Ross
8 asserts that this complex history enables historians to identify ‘the less obvious hierarchies’
9 supporting imperial power. Instead, ‘writing the environment into the history of empire’ with
10 this nuanced lens better helps global historians to achieve Chakrabarty’s goal of
11 ‘provincializing Europe’ (Ross, 2017; Chakrabarty, 2000).
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26 *A Research Agenda for the Anthropocene*

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31 More global histories are required on intra- and inter-imperial forces and processes of exchange
32 which stimulated and exacerbated global warming, scholarship which transcends dyadic core-
33 periphery models of imperial relationships in order to understand the interrelation of climate
34 and empire. The focus of ‘new imperial history’ on circuits of material, economic and scientific
35 exchange between—as well as within—empires is a useful lens for examining the histories of
36 atmospheric science and change beyond national frames of reference (Lester, 2006, 2015). The
37 oft-neglected international legal dimensions of the Anthropocene are also a promising area for
38 research, as ‘the legal organisation of empires and nation-States as well as of productions
39 processes was part of the technologies that prompted the Anthropocene’ (Viñuales, 2018).
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54 Increasingly, historians are clamouring for historical analyses of climate change ‘from below’,
55 studies which articulate perspectives from the Global South and map ‘experiences of climate
56 against a human history that is built on a scaffolding of inequality’ (Jacobs, Johnstone and
57 Kelly, 2016). These perspectives are a crucial, harrowing part of the global imperial story, for
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3 some of the poorest countries of the Global South ‘have not been able to overcome the
4 disadvantages of their colonial pasts’ and thus face what Rob Nixon has labelled ‘slow
5 violence’: attritional fatalities imposed on the poor through an unbalanced global economic
6 system (Nixon, 2011; Gardiner, 2011). In Davies’ formulation, any meaningful account of the
7 Anthropocene must ‘be underpinned by a historically nuanced account of how power relations
8 operate’, both across the earth system and between human beings (Davies, 2016).
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19 While those who subscribe to techno-boosterism long for the promised land of the
20 ‘technological sublime’ or the ‘unabashed utopia’ of stratospheric aerosol injections (Morton,
21 2015), the world cannot afford to rely on the unknowable outcomes of geoengineering
22 (Fleming, 2010; IPCC, 2018; Buck, 2020). As historians with a sense of professional ethics, if
23 we wish to avoid the unpredictable, asymmetrical global consequences of geoengineering, we
24 have a lot of work to do.
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35 *Conclusion*

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40 Although Chakrabarty’s ‘species history’ approach has discouraged some historians from
41 analysing climate change and empire, more recent scholarship perhaps indicates a gestalt shift.
42 Global historians are increasingly writing substantial analyses of this conjuncture. Brooke,
43 Malm, and Ross have shown that tracing the history of climate change need not rely on false
44 unities or binaries, namely, the simplistic ascription of climate change either to an
45 undifferentiated ‘humanity’ or to ‘the West’ alone, while depicting ‘the Rest’ as victims lacking
46 agency. These studies reveal intimate, necessarily *longue durée* linkages between the
47 industrialisation, fossil-fuel combustion, and exploitative socio-political structures
48 underpinning both imperialism and climate change. As Ann Laura Stoler urges, historians must
49 ‘attend to the *evasive* history of empire that disappears so easily into other appellations’; we
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3 must carefully dissect Stoler's pithy claim that '[t]he smell of industrial rubble masks ... the
4 toxins of imperial debris.' The goal is not to collapse complex histories of capitalism and
5 empire into some vague 'imperial genealogy', but 'to recognize that the "bio" in biopolitical
6 degradations is not haphazardly joined with histories of empire' (Stoler, 2016). By using the
7 analytical tools of global history to provide a 'finer-grained analysis' of the nexus between
8 humans and nature—including, crucially, empire and climate change—global historians have
9 a fundamental role to play in the research agenda for the Anthropocene (Viñuales, 2018). Only
10 by writing socially differentiated histories, which acknowledge the asymmetries in the
11 responsibility of 'humanity' for climate change, can historians help to de-naturalise global
12 power structures and economic inequities.
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