

## Storm-Clouds on the Horizon: John Ruskin and the Emergence of Anthropogenic Climate Change

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In February 1884 John Ruskin ascended the lectern at the London Institution and brought to his audience's attention 'a series of cloud phenomena, peculiar to our own times [...] which have not hitherto received any notice from meteorologists'. Ruskin termed this series of cloud phenomena 'the Storm-Cloud of the Nineteenth Century', a 'plague-wind' darkening the skies across the British Isles and indeed all of Europe. As befits a lecture to a scientific body, Ruskin began with a literature review: no mention of the storm-cloud is to be found in Homer, Virgil, Aristophanes, Horace, Chaucer, Dante, Milton, Thomson, Scott, Wordsworth, or Byron. 'Taking up the traditions of the air from the year before Scott's death', Ruskin turned to his own 'constant and close observation' of the atmosphere. He then detailed the descriptions of clouds to be found in many of these literary sources, coupled with his own observations, sketches, and paintings of clouds and sunsets in order to build the case for the existence of 'the plague-wind of the eighth decade of years in the nineteenth century; a period which will assuredly be recognized in future meteorological history as one of phenomena hitherto unrecorded in the courses of nature'.<sup>1</sup>

Ruskin was, of course, talking about anthropogenic climate change: a novel, well-nigh unthinkable phenomenon, produced by the age of industry but approachable only in the language of myth. If we are instinctively sceptical of the notion that this could have been true in Ruskin's time, there is far less doubt that it has *become* true in our own. This apparent paradox highlights the challenge of reading texts in the context of their futurity, tracing the meanings that cultural artefacts acquire in contexts far removed from the ones in which they were conceived. Wai Chee Dimock has described this problem in terms of 'resonance', by which she means a 'diachronic historicism' that 'tries to engage history beyond the simultaneous, aligning it instead with the dynamics of endurance and transmission that accompany the passage of time'. This approach highlights the 'travelling frequencies of literary texts' which are 'received and amplified across time'. As they move ever farther from their points of

<sup>1</sup> John Ruskin, *The Storm-Cloud of the Nineteenth Century: Two Lectures Delivered at the London Institution* (Orpington: Allen, 1884), pp. 2, 43.

origin, these frequencies occasion ‘unexpected vibrations in unexpected places’ such that texts themselves become emergent phenomena ‘activated and to some extent constituted by the passage of time’.<sup>2</sup> Dimock’s account of resonance can also be thought of in terms of what climatologists call *teleconnection*, the phenomenon whereby individual events may be linked across spatial and temporal distances too large to map in terms of observable cause and effect. Hence, while scholars are often rightly suspicious of teleological presentism, such textual futures are a key component of the challenge to the humanities posed by life in the Anthropocene. The feedback loops driving global climate change transform the banal actions of everyday life into consequences that will continue to adapt and evolve beyond the geographical or temporal scale of our knowledge. This, in turn, becomes one of the key features of climate change as both a concept and a material phenomenon: it can only be understood as part of the adaptive, evolutionary processes of conceptual innovation in which (as in biological evolution) utility is always belated. The meaning, and certainly the ultimate implications, of words, concepts, and forms become legible only in retrospect. We cannot help but name the future, which is precisely why the study of the past remains vital in the attempt to confront the Anthropocene.

My goal here is less to treat Ruskin as a subject of analysis than as an interlocutor, a fellow ecocritic engaged in a complementary project, and thus an ally. If ecocriticism is, at bottom, a critical practice defined not simply by situating cultural artefacts in relation to social and environmental problems, but also by trying to redress those through social and ecological action, then Ruskin surely belongs within, and perhaps even inaugurates, that lineage. I begin by situating Ruskin’s lectures in their historical context, discussing both the material and cultural validity of the claim that the late nineteenth century would be marked in future meteorological history by the emergence of phenomena ‘unrecorded in the courses of nature’, before turning to the process of conceptual emergence and the uncanniness of Anthropocene history and the ways in which the voices of the dead can be called upon to foster transhistorical ecological community.

Ruskin could offer no explanation of what the phenomena meant ‘according to your modern beliefs’, but went on to say that ‘I can tell you what meaning it would have borne to the men of old time’, noting that ‘of states in such moral gloom every seer of old predicted the physical gloom’, and leaving his audience:

To compare at leisure the physical result of your own wars and prophecies, as declared by your own elect journal not fourteen days ago, — that the Empire of England, on which formerly

<sup>2</sup> Wai Chee Dimock, ‘A Theory of Resonance’, *PMLA*, 112 (1997), 1060–71 (p. 1061).

the sun never set, has become one on which he never rises.  
(*Storm-Cloud*, pp. 61–62, 62)

Ruskin turns back to an age when the sky was a place of portent, when atmospheric changes heralded not merely a change in the weather but divine judgement. In so doing, he helps us to understand a core conceptual problem posed by anthropogenic climate change: it does not simply alter the physical *processes* of the climate; it changes what climate *is*, insofar as it no longer lies (if it ever did) beyond the scope of human history. Where meaning in the skies once bespoke the will of God, it is now bequeathed by the effluence of human affluence. In this regard, Ruskin's attacks on a society worshipful of what he elsewhere called 'the Goddess of Getting-on' anticipate more recent critiques linking climate change to capitalism.<sup>3</sup> Like the debates that continue to simmer over that other Victorian invention — biological evolution — climate change appears incongruous with a world in which all is ordered according to divine writ. The storm-cloud of modernity was at once utterly new and a return to ancient days when climatology was prophecy. The question of climate change must be approached as a question of meaning, of ideology, and of belief instead of simply as a material phenomenon consisting of greenhouse gases, temperature fluctuations, melting ice caps, rising seas, and ever more erratic weather patterns. Ruskin recognized that modern society had changed the climate, and in so doing had changed its own relation to it. No longer could the weather be viewed purely as the wind and rain rattling the windows — all-pervasive, overwhelmingly powerful, but signifying nothing.<sup>4</sup> However, this recognition is not merely thematic, but also formal, insofar as it presents a novel state of affairs that is also a return to a premodern ordering of the world. This recursive, or, more accurately, iterative structure is integral to both Ruskin's argument and its relevance to our own attempts to wrestle with the implications of what Devin Griffiths calls the 'no-analog future' posed by climate change by making recourse to the cultural artefacts of the past.<sup>5</sup> The Anthropocene is at once an entirely novel phenomenon, and one in which the past exerts unprecedented force upon the future. As Andreas Malm argues, 'in a warming world' the literal weight of history, congealed in atmospheric CO<sub>2</sub>, 'weighs down heavier and heavier, on the bodies of the living and their surroundings, in a relentless consolidation of

<sup>3</sup> John Ruskin, *The Crown of Wild Olive: Three Lectures on Work, Traffic, and War* (New York: Wiley, 1866), p. 66.

<sup>4</sup> See Jan Golinski, *British Weather and the Climate of Enlightenment* (Chicago: University of Chicago Press, 2007); Lucian Boia, *The Weather in the Imagination*, trans. by Roger Leverdier (London: Reaktion, 2005).

<sup>5</sup> Devin Griffiths, *The Age of Analogy: Science and Literature Between the Darwins* (Baltimore: Johns Hopkins University Press, 2016), pp. 258–59.

the tyranny of the past'.<sup>6</sup> Such comparisons are not mere metaphors, but rather offer the reminder that the Anthropocene is itself a historical condition, a signal moment in Earth's history wrought by its entanglement with one of its most prolific, disruptive, and creative inhabitants.<sup>7</sup> This is not simply a matter of history's *weight*, but rather its speed. As Tobias Menely notes, the Anthropocene is an age of acceleration, in which the ever-accumulating effluence of historical combustion accelerates and concentrates the Earth's absorption of solar radiation.<sup>8</sup> We must come to terms with the past, because it is coming for us.

Climate, like history, must now be acknowledged as a product of human action. As Dipesh Chakrabarty has argued, this state of affairs presents a radical challenge to the humanities, which have long taken their province from Giambattista Vico's dictum that humans can only truly know that which humanity has created (history, society, culture), while believing that only God could know nature because God created it.<sup>9</sup> While more recent formulations tend to leave divinity out of the picture, they remain no less sceptical that human knowledge could access anything beyond its own constructions, most notably language. However, by uncovering the hidden histories and morphologies of language, philology in Vico's sense of 'the science of everything that depends on human volition' has long enabled us to examine the deep reservoirs of collective memory through which human beings have come to inhabit a world replete with

<sup>6</sup> Andreas Malm, *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming* (New York: Verso, 2016), p. 10.

<sup>7</sup> The identity of the 'Anthropos' is one of the most controversial aspects of the Anthropocene idea, at least within the humanities. Depending on who you ask, the definitive agent of the new epoch may derive from: capitalism as 'a particular way of organizing nature' (Jason Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (New York: Verso, 2015), p. 2); the combustion of fossil fuels occasioned by the turn to steam power (Malm, esp. pp. 28–29); imperial conquest and globalization, beginning with the European conquest of the Americas (Simon L. Lewis and Mark A. Maslin, 'Defining the Anthropocene', *Nature*, 519 (2015), 171–80); the human species's facility for manipulating the symbolic realm (Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Holt, 2014), p. 258); or agricultural colonization (Donna Haraway and others, 'Anthropologists Are Talking — About the Anthropocene', *Ethnos*, 81 (2016), 535–64 (p. 557)). In each case, it proceeds not from the innate biological existence of *Homo sapiens* (in which case it would predate the Holocene), but rather from the technological enhancements, organization, and variation that make us human, which is precisely why the critical tools and concepts of the humanities are integral to addressing its iniquities.

<sup>8</sup> Tobias Menely, 'Late Holocene Poetics: Genre and Geohistory in *Beachy Head*', *European Romantic Review*, 28 (2017), 307–14.

<sup>9</sup> See Dipesh Chakrabarty, 'The Climate of History: Four Theses', *Critical Inquiry*, 35 (2009), 197–222.

signification and meaning.<sup>10</sup> What we need now is a distinctly *ecological* philology that acknowledges language's active role in affecting the workings of nature. Ecological philology calls on us to recognize that our ideas, like our actions, have consequences beyond what we can know, and that our ethical responsibility thus extends outside the purview of our knowledge. Doing so means attempting to trace 'lamentably obscure causes and infinitely diverse effects' of adjacent possibility, and attuning ourselves (both ontologically and epistemologically) to non-human agency.<sup>11</sup> The foundations of this move are already evident in Vico's philology, as when he traces the origins of the Latin *lex* (law) back to 'the gathering of acorns' by the forest-dwelling forebears of Rome, providing a model for conceptualizing 'a gathering of citizens' (p. 98). What matters in this instance is less whether Vico was right in his surmises than the idea on which they are predicated, of language as a material interface with the world. In that view, philology has always been a form of historical ecology, one that reveals human society's entanglement with other organisms.

This transposition of meaning thus simultaneously acknowledges signification to be a constructed, ideological thing and (however paradoxically this may appear) also places it on a continuum that extends far beyond the province of the human, in keeping with Donna Haraway's insistence that 'storying cannot any longer be put into the box of human exceptionalism'.<sup>12</sup> As Jesper Hoffmeyer chides:

Our ecological awareness is still stuck at the physico-chemical level where energy currents, biomass, and food chains constitute standard categories. Consequently, we tend to overlook the fact that all plants and animals — all organisms, come to that — live, first and foremost, in a world of *signification*.<sup>13</sup>

<sup>10</sup> Giambattista Vico, *New Science*, trans. by David Marsh, 3rd edn (New York: Penguin, 2001), p. 5.

<sup>11</sup> Vico, p. 5. As is perhaps obvious, I am using philology not in its strictly textual, nineteenth-century sense, but rather in the interpretive manner advocated by Edward Said: 'A truly philological reading is active; it involves getting inside the process of language already going on in words and making it disclose what may be hidden or incomplete or masked or distorted in any text we may have before us. In this view of language, then, words are not passive markers or signifiers standing in unassumingly for a higher reality; they are, instead, an integral formative part of the reality itself' (*Humanism and Democratic Criticism* (New York: Columbia University Press, 2004), p. 59).

<sup>12</sup> Donna J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, NC: Duke University Press, 2016), p. 39.

<sup>13</sup> Jesper Hoffmeyer, *Signs of Meaning in the Universe*, trans. by Barbara J. Haveland (Bloomington: Indiana University Press, 1996), p. vii, emphasis in original.

Hoffmeyer dubs this shared world of signification the ‘semiosphere’, in a telling echo of the language of Earth systems science which studies the Earth as a single system comprised of the atmosphere, biosphere, hydrosphere, and geosphere. Hoffmeyer’s term adds the crucial insight that the Earth system cannot be understood without active attention to signification and meaning-making as integral features of the modes of interaction among those interlocking systems.

In terms of climatic history, this turn resonates with Charles Babbage’s proposal that Earth’s atmosphere ‘is one vast library, on whose pages are forever written all that man has ever said or even whispered’.<sup>14</sup> Babbage collapses the distinction between actions and language on the one hand, and between the acts of humans and other entities on the other: by focusing on the movement of molecules, he presents the atmosphere as a space in which conscious acts by sentient beings are directly commensurate with the operations of non-living systems, something that is in fact true of the Earth system, where, as Jeremy Davies explains, ‘the difference of kind between life and nonlife becomes only a difference of scale between kindred geophysical forces.’<sup>15</sup> A version of Babbage’s idea has been realized in ice core data, the most important archive of climatic history. Echoing Babbage’s terms, the scientists who analyse the cores describe them as a ‘library’ and those who maintain them as its ‘curators’.<sup>16</sup> The ice cores are literal pieces of history, in which the atmosphere of ages past remains suspended; and while ‘reading’ them consists of chemical analysis rather than tracing the physical movement of molecules, such analysis retains Babbage’s commitment to the notion of an atmospheric record insofar as speech is carried on the breath and thus consists of both sound waves and vaporous exhalation. When we melt ice cores in order to analyse their composition, we release molecules exhaled by beings who lived thousands of years ago.

By treating these exhalations as records, we transform them into messages even though they were not originally intended as such. This, in turn, highlights the reflexivity that distinguishes the Anthropocene from all other geological epochs: the ‘Anthropos’ is both the force at work within the Earth system and the entity that reads its own story within the rocks.<sup>17</sup> It thus approximates the deciphering of human inscriptions more closely

<sup>14</sup> Charles Babbage, *The Ninth Bridgewater Treatise: A Fragment* (London: Murray, 1837), p. 113.

<sup>15</sup> Jeremy Davies, *The Birth of the Anthropocene* (Oakland: University of California Press, 2016), p. 61.

<sup>16</sup> See Jesse Oak Taylor, ‘Auras and Ice Cores: Atmospheric Archives and the Anthropocene’, *minnesota review*, n.s., 83 (2014), 73–82.

<sup>17</sup> See Tobias Menely and Jesse Oak Taylor, ‘Introduction’, in *Anthropocene Reading: Literary History in Geologic Times*, ed. by Tobias Menely and Jesse Oak Taylor (University Park: Pennsylvania State University Press, 2017), pp. 1–24 (p. 3).

than the interpretation of other biostratigraphic evidence, in which the idea of the Earth as recording device ceases to be metaphor and becomes a far more literal truth. Nonetheless, as Dana Luciano points out, many stratigraphers have been reluctant to correlate ice core data with humanistic evidence or to allow the ‘choice of human narrative’ to affect the dating of the Anthropocene.<sup>18</sup> In a term that resonates with Ruskin’s religious language, Luciano argues that this adherence to stratigraphic protocols ‘contradicts [...] the *spirit* of the Anthropocene’, not only because it mutes the ‘radical difference’ that separates the epoch from all others, but also because of the prospective quality that means ‘we *cannot yet say* what will become geological evidence’ or how it will be interpreted (p. 113, emphases in original).

By contrast, correlating literary and cultural artefacts against such expansive, inhuman archives offers the potential to give *form* to the vanished entities whose disembodied breath is suspended in ice. Perhaps more importantly, it helps situate those forms within the causal chains that would explain their significance, an ongoing story in which we too are enmeshed. Eric Gidal offers one model for this practice, which he calls ‘biblio-stratigraphy’, tracing social and geological history through the reception history of James Macpherson’s Ossian poems. Gidal looks not merely to the poems themselves, but also to nineteenth-century efforts to prove their authenticity by locating key sites in the Scottish landscape. In this admittedly idiosyncratic collection of books, he finds ‘layered sediments of translation and divergence’ which ‘reveal variations and irregularities born of a momentous acceleration in environmental history’ as well as the ‘signatures of violent contests of displacement and extraction in an industrializing archipelago’.<sup>19</sup> In similarly open-ended fashion, Ruskin’s storm-cloud lectures have the potential to ‘*become* important environmental records for our own moment’, in part because of the ways they unsettle the widespread assumption that the Anthropocene is either inevitable or unforeseen (Gidal, p. 182, emphasis in original). Ruskin’s struggle to find language in which to conceptualize the storm-cloud of the nineteenth century as a phenomenon ‘hitherto unknown in the courses of nature’ offers an apt correlate to our own efforts to grapple with the Anthropocene, as both unprecedented in scale and yet of a piece with the long history of human entanglement with the Earth system.

*The Storm-Cloud of the Nineteenth Century* oscillates between articulating its subject in material, meteorological, and spiritual terms, the sign of impending judgement upon a blasphemous society. In that oscillation lies the space of conceptual emergence. However inchoate his vision of

<sup>18</sup> Dana Luciano, ‘Romancing the Trace: Edward Hitchcock’s Speculative Ichnology’, in *Anthropocene Reading*, ed. by Menely and Taylor, pp. 96–116 (p. 113).

<sup>19</sup> Eric Gidal, *Ossianic Unconformities: Bardic Poetry in the Industrial Age* (Charlottesville: University of Virginia Press, 2015), p. 181.

the dynamics in question, Ruskin recognized not only that the physical climate was changing as a result of human action, but also that such changes heralded a much deeper contradiction within industrial modernity itself. His challenge can be productively understood as how to begin the fraught conversation about anthropogenic climate change. How do you inaugurate a concept, give it form, and imbue it with significance? Given his attempts to trace the storm-cloud through the cultural artefacts of the past, Ruskin's project also provides a useful means for thinking about the work of the humanities in the Anthropocene.

Any consideration of *The Storm-Cloud of the Nineteenth Century* as an account of climate change must begin by acknowledging that Ruskin's original audience thought he was crazy. Many simply dismissed his claims as the delusions of a mind slipping into madness or an old man succumbing to the more prosaic shadows of old age 'when the nipping eager air which we laughingly breasted in youth chills us to the marrow'.<sup>20</sup> Initial biographical and scholarly assessments tended to agree. Quentin Bell would later write (from the chair created for Ruskin at Oxford): 'It was a symptom of his approaching madness when after a series of inclement summers he began to fancy that nature herself was darkening and that the skies were veiled with smoke.'<sup>21</sup> Others simply treated Ruskin's argument as a condemnation of the 'spirit of the age', in which the 'physical gloom' was taken as a means of figuring the moral, and any question of its material veracity was beside the point.

The problem with these dismissals is that Ruskin was right. Ice cores taken at the poles reveal a marked spike in carbon content beginning in the middle of the nineteenth century.<sup>22</sup> By the 1870s, after a century of rapid industrialization coupled with exploding population growth and urbanization, coal smoke rising from the furnaces firing the engines of industrial modernity had so altered the dynamics of the atmosphere as to produce a darkness visible even in the skies of the Lake District, where Ruskin had retreated in hopes that immersion in nature would heal his mental and physical infirmities. With the recent upsurge in environmental awareness, there has been an increased tendency to take Ruskin's claims seriously and to treat the 'storm-cloud' within the discourse of environmental pollution

<sup>20</sup> 'Topics of the Week', *Graphic*, 9 February 1884, p. 122. Despite this initial scorn, the idea did percolate into the popular lexicon at least to some extent, as when the *Liverpool Mercury* observed six months later that 'one of Mr. Ruskin's "storm-clouds" seems to have come upon London to-day' ('Our London Correspondence', August 1884, p. 5).

<sup>21</sup> Quentin Bell, *Ruskin* (London: Hogarth Press, 1963), p. 138.

<sup>22</sup> Richard B. Alley, *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future* (Princeton: Princeton University Press, 2002); Wolfgang Behringer, *A Cultural History of Climate*, trans. by Patrick Camiller (Cambridge: Polity, 2010).

that emerged in the nineteenth century.<sup>23</sup> Indeed, Vicky Albritton and Fredrik Albritton Jonsson describe Ruskin as ‘the first great intellectual figure to broach the idea that coal burning gave rise to anthropogenic climate change’.<sup>24</sup> A committed literalist might object that the atmospheric accumulation of CO<sub>2</sub> is invisible, and had yet to attain concentrations capable of influencing global climate patterns (which is part of the rationale for formalizing the emergence of the Anthropocene at the later, mid-twentieth century date).<sup>25</sup> Thus, what Ruskin was witnessing could not be anthropogenic climate change per se, but rather the atmospheric and historical forces that would ultimately lead to it. The other problem is that Ruskin himself explicitly invokes the discourse of environmental pollution in his excoriation of ‘sulphurous chimney-pot vomit’ and ‘Manchester devil’s darkness’, but he does so only to refute them, along with the ‘London particular’ as adequate explanations for the ‘plague-wind’ (*Storm-Cloud*, pp. 57, 56). Thus, an ecological reading of *The Storm-Cloud of the Nineteenth Century* runs the risk of simply inverting the earlier dismissal, substituting the ‘physical gloom’ for the ‘moral’ (or delusional) as the real subject of the lecture, and thus missing the fact that the inextricability of the two is Ruskin’s chief concern. His greatest contribution to our understanding of anthropogenic climate change lies in the recognition that it violates not merely the order of nature but also the ordering of human society. Albritton and Jonsson frame this as a problem of scale, noting that ‘the discovery of an all-pervasive change in the atmosphere [...] indicated a

<sup>23</sup> See Jonathan Bate, *Romantic Ecology: Wordsworth and the Ecological Tradition* (London: Routledge, 1991), p. 67. Katharine Anderson, on the other hand, argues that ‘connecting *Storm-Cloud* with other contemporary arguments about pollution can be misleading: the consciousness of “new skies” in the same period has more to do with the aftereffects of the volcanic eruption of Krakatoa in 1883 than with any particular changes in the perception of the causes or effects of industrial pollution.’ See Katharine Anderson, *Predicting the Weather: Victorians and the Science of Meteorology* (Chicago: University of Chicago Press, 2005), p. 231. The problem with this argument is that Ruskin explicitly dates the ‘storm-cloud’ to 1871 and traces its emergence over the twenty years prior, noting that ‘the phenomena came on gradually’. Nevertheless, the volcanic eruption did contribute to the apocalyptic sense prevailing at the *fin de siècle* and informed Ruskin’s language, as it would in Svante Arrhenius’s discussion of climate change in *Worlds in the Making: The Evolution of the Universe*, trans. by H. Borns (New York: Harper, 1908), where it is paired with coal combustion as a source for rising carbonic acid levels in the atmosphere, thus producing a *fin-de-siècle* correlate to the cultural impacts that Gillen D’Arcy Wood traces in *Tambora: The Eruption That Changed the World* (Princeton: Princeton University Press, 2014).

<sup>24</sup> Vicky Albritton and Fredrik Albritton Jonsson, *Green Victorians: The Simple Life in John Ruskin’s Lake District* (Chicago: University of Chicago Press, 2016), p. 14.

<sup>25</sup> Jan Zalasiewicz and others, ‘When Did the Anthropocene Begin?: A Mid-Twentieth Century Boundary is Stratigraphically Optimal’, *Quaternary International*, 383 (2015), 196–203.

crisis that spanned the whole range of the physical world and of human civilization' (p. 36). Ruskin's argument is thus not simply that anthropogenic climate change was occurring, but also that it was a distinctly moral and spiritual problem in addition to being a scientific or material one. As Allen MacDuffie explains, 'what appears at first as a network of relations comes, in his late writings, to look more like a feedback loop or spiral into irreversible climate chaos: degraded environments producing degraded tastes producing degraded consumer choices producing a degraded world', a logic that Ruskin follows 'to a decidedly unscientific but nevertheless powerful narrative of anthropogenic global ecocide'.<sup>26</sup> What I want to underscore here is that while Ruskin's logic may be 'decidedly unscientific' it also crosses and recrosses the very divide between human and natural history that the Anthropocene forces us to think beyond, and in so doing reintroduces the moral and political claims that must lie at the heart of any solution to the problems posed by climate change.

In order to understand Ruskin's lectures, and the degree to which they stage the difficulties of imagining, conceptualizing, and talking about climate change, we must situate them within broader nineteenth-century discourses around ideas ranging from pollution and climate to nature itself. What is perhaps most surprising is the fact that a disquisition on air pollution and climate change per se would have struck a familiar chord with his audience, especially given that the lectures were delivered in London, where the problem of urban filth had a long pedigree, and 'smoke abatement' was a matter of political, scientific, ideological, and aesthetic debate fraught with background.<sup>27</sup> By the late nineteenth century, the religiously inflected Romanticism of anti-industrialization critiques like Blake's lament at the prospect of building a new Jerusalem amid the 'dark satanic mills' (echoed in Ruskin's 'Manchester devil's darkness') was being supplanted by more explicitly materialist accounts of ecological change. George Perkins Marsh's *Man and Nature; or, Physical Geography as Modified by Human Action* (1864), detailed the range of effects wrought upon Mediterranean ecosystems by long human habitation, with particular focus on erosion as a result of deforestation during the Roman Empire. Marsh notes:

<sup>26</sup> Allen MacDuffie, *Victorian Literature, Energy, and the Ecological Imagination*, Cambridge Studies in Nineteenth-Century Literature and Culture, 93 (Cambridge: Cambridge University Press, 2014), p. 138.

<sup>27</sup> See Jesse Oak Taylor, *The Sky of Our Manufacture: The London Fog in British Fiction from Dickens to Woolf* (Charlottesville: University of Virginia Press, 2016); MacDuffie, *Victorian Literature, Energy, and the Ecological Imagination*; and Peter Brimblecombe, *The Big Smoke: A History of Air Pollution in London Since Medieval Times* (London: Methuen, 1987).

It is still too early to attempt scientific method in discussing this problem [climate change, in this case due to deforestation], nor is our present store of the necessary facts by any means complete enough to warrant me in promising any approach to fullness of statement respecting them.

Nonetheless, Marsh lists an extensive array of scholars who have addressed ‘the subject of climate change, with and without reference to human action as a cause’ since antiquity.<sup>28</sup> While early accounts of climate change focused almost exclusively on deforestation and cultivation, by the late nineteenth century there was increasing speculation about the aggregated effects of coal combustion on the atmosphere. The ‘discovery of global warming’ is often credited, somewhat problematically, to the Swedish chemist Svante Arrhenius, who first published it in 1897 (i.e. thirteen years after Ruskin’s lecture).<sup>29</sup> The all-important mechanism of climatic feedback (later known as the albedo effect) had been theorized by geologist James Croll in terms of the connections between glacial melt, solar radiation, and ocean currents; the ‘greenhouse effect’ performed by Earth’s atmosphere had been theorized by John Tyndall in 1859.<sup>30</sup> Where accounts such as Henry Thomas Buckle’s *History of Civilization in England* (1857–61) presented evidence for determining the impact of climate on culture, these theories — Marsh’s most forcefully and explicitly — closed the ‘feedback loop’ (to use MacDuffie’s term) by asking how human action might in

<sup>28</sup> ‘Alexandre Moreau de Jonnès, Adolphe Jules César Auguste Dureau de la Malle, François Arago, Humboldt, Fuster, Auguste de Gasparin, Antoine César Becquerel, and many other writers in Europe, and by Noah Webster, Samuel Forry, Daniel Drake, and others in America. Karl Fraas has endeavored to show, by the history of vegetation in Greece, not merely that clearing and cultivation have affected climate, but that change of climate has essentially modified the character of vegetable life.’ See George Perkins Marsh, *Man and Nature; or, Physical Geography as Modified by Human Action*, ed. by David Lowenthal (Seattle: University of Washington Press, 2003), p. 14.

<sup>29</sup> See, for example, Spencer R. Weart’s *The Discovery of Global Warming* (Cambridge, MA: Harvard University Press, 2003). James Rodger Fleming cautions against such accounts: ‘More recently, Arrhenius has been lauded as the father of the theory of the greenhouse effect, even of global warming. One author [Weart] claimed that “Arrhenius had enough spectroscopic information to estimate that doubling the amount of carbon dioxide in the air could warm the world by four to six degrees”, that “the industrial output of carbon dioxide had already reached a level comparable to the amount that circulated naturally”, and that Arrhenius had “discovered” the greenhouse effect in 1896. (Spencer Weart, ‘From the Nuclear Frying Pan into the Global Fire’, *Bull. Atom. Sci.* (June 1992), 19–27; *emph. add.*) All three statements are misleading and incorrect.’ See James Rodger Fleming, *Historical Perspectives on Climate Change* (Oxford: Oxford University Press, 1998), p. 79.

<sup>30</sup> On Croll and the albedo effect, see Behringer, p. 183; on Ferrier, Tyndall, and the greenhouse effect, see Fleming, pp. 76–77.

turn determine the material conditions of human habitation.<sup>31</sup> All of this is to say that Ruskin's lecture seemed to push the bounds of reason to his original audience not because they were *not* ready to hear what we would think of as an environmentalist argument, in other words, but rather because they *were*.<sup>32</sup> His argument sounded strange when he delivered it for the same reason that it does today — its conflation of ostensibly material and spiritual registers of meaning — a reminder that we remain in some respects as Victorian in our modern beliefs as we do in our fossilized mode of economic production.

At this juncture, we might be tempted to chalk up the tenor of Ruskin's lectures to mere scientific ignorance on behalf of the art theorist. However, Ruskin's meteorological knowledge was rigorous, far-reaching, and in dialogue with the scientists of his day. His first published work was on meteorology. *Modern Painters* includes a systematic analysis of skies that aesthetically inclined meteorologist John Thornes describes as 'the only attempt I have ever seen published, even to this day, to illustrate cloud perspective'.<sup>33</sup> Daniel Williams explains that in his later writings Ruskin 'allows his concern with representational accuracy and empirical knowledge to give way to myth and allegory' without (to his mind) sacrificing their scientific validity. As Williams notes, by 'naturalizing mythical narratives and refracting his argument for truthful representations through a historical optic, Ruskin defends the vital, felt, "instinctive truth in ancient symbolism"' and argues that stories such as the mythic descriptions of Athena can offer "accurate mythic expressions of natural phenomena".<sup>34</sup> Ruskin's approach, in other words, constitutes a version of what Thornes calls 'cultural climatology', in which he examines paintings as a more direct (or at least tangible) means to experience the atmosphere as an entity otherwise 'seemingly regarded by many meteorologists as an

<sup>31</sup> James Winter, *Secure from Rash Assault: Sustaining the Victorian Environment* (Berkeley: University of California Press, 1999), pp. 34–37.

<sup>32</sup> They would not, however, have used the term 'environmentalism' to articulate that idea; or rather, if they did, it would not have been out of concern for the fragility of environment but in recognition of humans and nature as mutually influential entities. As James Winter explains, 'when Victorians and Edwardians used the word "environmentalism", they usually had in mind, not concern about the state of the planet, but an interpretative framework: the proposition that crucial aspects of human life and history are determined by distinct physical settings. The gradual incorporation of the Darwinist and pre-Darwinist concept of natural selection strengthened conceptual underpinnings for the notion that physical surroundings supply the structure within which and against which civilizations evolve' (p. 19).

<sup>33</sup> John E. Thornes, *John Constable's Skies: A Fusion of Art and Science* (Birmingham: University of Birmingham Press, 1999), p. 194.

<sup>34</sup> Daniel Williams, 'Atmospheres of Liberty: Ruskin in the Clouds', *ELH*, 82 (2015), 141–82 (p. 156).

invisible fluid that inhabits their super-computers'.<sup>35</sup> Ruskin grants historical mediations a great deal more credence, treating them not so much as direct 'representations' but instead as 'expressions'. In any case, though Ruskin's climate models were rendered in sketches and diary entries rather than in numerical calculations, the 'constant and close observation' of the atmosphere referenced in the lectures was a real, lifelong pursuit.

Ruskin was, in other words, *capable* of articulating the challenge presented by the storm-cloud of the nineteenth century 'according to your modern beliefs' (*Storm-Cloud*, p. 62). He preferred not to. It is in his refusal to choose between the material and the meaningful that makes Ruskin reveal the contradictions and complexity inherent in an idea like the Anthropocene, the articulation of which depends not only on ice cores, sediment layers, and sophisticated computer simulations, but also on residual mythologies echoing back over the millennia that human beings have looked to the climate and weather as spheres utterly beyond our influence. Reconsider, in this context, the crux of Ruskin's argument: his refusal to explain the storm-cloud 'according to your modern beliefs'. 'Modern' here must be understood not merely as 'recent' or current to Ruskin's moment, but as the broader condition of modernity and its underpinnings in what Bruno Latour calls the 'Modern Constitution'. According to Latour, the Modern Constitution holds that 'Nature and Society must remain absolutely distinct: the work of purification must remain absolutely distinct from the work of mediation'.<sup>36</sup> Ruskin's account of the storm-cloud is situated in the messy middle of that ostensible divide. For him, the language of art, whether painting, poetry, or architecture, offers a material interface with a 'mythic expression' of the world such that the traces of vanished ecologies can remain discernible within it, much in the same way as living species retain imprints of the lost life forms with which the living co-evolved.<sup>37</sup> Not only does the storm-cloud appear to consist 'of dead men's souls' (*Storm-Cloud*, p. 4), but the words in which he seeks to describe it echo the voices of the dead.

The long history of laments over ecological destruction complicates the narrative of the Anthropocene as an entirely unprecedented predicament. As Christophe Bonneuil and Jean-Baptiste Fressoz argue:

<sup>35</sup> John E. Thornes, 'Cultural Climatology and the Representation of Sky, Atmosphere, Weather and Climate in Selected Art Works of Constable, Monet and Eliasson', *Geoforum*, 39 (2008), 570–80; *John Constable's Skies*, p. 19.

<sup>36</sup> Bruno Latour, *We Have Never Been Modern*, trans. by Catherine Porter (Cambridge, MA: Harvard University Press, 1995), p. 32.

<sup>37</sup> Elaine Gan and others, 'Introduction: Haunted Landscapes of the Anthropocene', in *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, ed. by Anna Tsing and others (Minneapolis: University of Minnesota Press, 2017), pp. G1–G12, esp. pp. G4–G5.

The cultural history of the Anthropocene [...] is borne by cultural and ideological devices that are contemporary with it and still active today. The history of the Anthropocene is not one of a frenetic modernism that transforms the world while ignorant of nature, but rather of the scientific and political production of a modernizing unconscious.<sup>38</sup>

The idea of a ‘modernizing unconscious’ speaks to the persistent uncanniness of Anthropocene history, which is shot through with striking coincidences, such as the fact that the steam engine and the science of stratigraphy were developed in the same time and place (Scotland in the late eighteenth century), or the fact that global climate models (developed to track nuclear fallout) and the recording of atmospheric CO<sub>2</sub> align with the beginning of the ‘Great Acceleration’, now poised to become the formal beginning of the new epoch.<sup>39</sup> Such uncanny alignment troubles the notion that the material impacts of human action upon the Earth system can be considered apart from the modelling technologies and epistemological frameworks by which they become visible, suggesting that the Anthropocene can *only* be fully understood if we take those intersections into account. The Global Stratotype Section and Point (GSSP) that makes the Anthropocene official will be affixed within the semiosphere as well as the lithosphere, and hence it cannot *not* be a political act, one that promises to shape the future history of the epoch it describes (Menely and Taylor, p. 10). After all, as Amitav Ghosh has recently argued, ‘it is not as if we had not been warned; it is not as if we were ignorant of the risks.’<sup>40</sup> The question, then, becomes what use we can now make of those overlooked warnings. What authority can they hold now that they have proven accurate? How do we credit the authority of the unheeded dead?

In Anthropocene history, *all* events must be understood as both material and cultural phenomena; as such, they are also sites of potential resistance, when the modernizing unconscious gives way to the ecological uncanny in moments of transhistorical solidarity. Ruskin anticipates this turn in the resolutely anti-modern rhetoric of the ‘Storm-Cloud’ lectures by refusing to restrict his arguments to either the moral or material domain, as when he slips within a single paragraph from concern about the atmospheric corrosion of London’s architecture to abjuring his audience for

<sup>38</sup> Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene: The Earth, History and Us*, trans. by David Fernbach (New York: Verso, 2015), p. 199.

<sup>39</sup> Colin N. Waters and others, ‘The Anthropocene is Functionally and Stratigraphically Distinct from the Holocene’, *Science*, 351.6269 (2016) <<https://doi.org/10.1126/science.aad2622>>.

<sup>40</sup> Amitav Ghosh, *The Great Derangement: Climate Change and the Unthinkable* (Chicago: University of Chicago Press, 2016), p. 55.

blasphemy. Once we understand Ruskin's refusal to account for the storm-cloud of the nineteenth century in strictly material terms not as a failure, but rather as a choice, we are presented with the question of what is enabled by that refusal, and what if anything he achieves by it. The answer, I propose, is that the residues of past world views constitute the basis for conceptual and epistemological innovation: telling his audience what the storm-cloud 'would have meant to the men of old time' is a way of heralding what it means for the future, such that history becomes a bastion from which to resist the obfuscating work of the modernizing unconscious in the present.

At the centre of *The Storm-Cloud of the Nineteenth Century* is a very literary challenge: how do you describe something that has no name, and for which there is no language? Ruskin's predicament is much the same as that which confronts any writer or novelist who struggles with the challenge of how to begin a work that will be *original* in the full sense of the word: genuinely new and different from that which has come before and thus offering a new means of conceptualizing the world. It is perhaps unsurprising, then, that one of the earliest attempts to formulate a rigorous definition of emergence comes not from a physicist or biologist, but from a literary theorist uniquely concerned with the interface between materiality and meaning. Raymond Williams used the idea of 'dominant, residual, and emergent' cultural forms to integrate the particularity and movement of historical analysis with the idea of cultures as systems. As Williams explains, 'since we are always considering the relationships within a cultural process, definitions of the emergent, as of the residual, can be made only in relation to a full sense of the dominant.'<sup>4</sup> The dominant, here, must be understood to extend beyond the overt trappings of power to the less conscious level of *all* cultural production and value, extending to the very basis of what can be thought or communicated in coherent, logical (or even intuitive) terms. Anything that can be easily expressed within the dominant discourse, even if it pertains to the past or the future, is thus nevertheless part and parcel of it. However, no dominant culture is ever all-encompassing: 'No mode of production and therefore no dominant social order ever in reality includes or exhausts all human practice, human energy, and human intention' (p. 124). Thus, the emergent and the residual are the means by which Williams conceptualizes those realms of practice unacknowledged by the dominant mode, in which an alternative to it may arise. The residual refers to those elements of the past that continue to remain 'active in the cultural process [...] as an effective element of the present', and thus may not even be recognized as past, as opposed to the 'archaic' elements 'wholly recognized as an element of the past'

<sup>4</sup> Raymond Williams, *Marxism and Literature* (Oxford: Oxford University Press, 1977), p. 123.

(p. 122). The residual is, in other words, the historical unconscious. The emergent, meanwhile, arises in those areas of human practice unacknowledged, ignored, or as yet resistant to the dominant mode, and becomes the basis of a genuine alternative to it. Williams distinguishes the emergent from the ‘merely novel’, or those new forms that are readily internalized by the dominant, based not so much on its *opposition* to the dominant as its extension beyond it. The residual and emergent share in being those elements externalized by the dominant culture. This is a key point because it links ideas of exclusion and emergence, not merely in terms of framing material waste as *productive* (it is, after all, the agency of waste that is changing the global climate), but also by highlighting the constitutive power of negation, of the unthinkable, the unmentionable, the obscene — all that is excluded from the realm of the possible as constrained by the Modern Constitution. The rather obvious difference between the residual and the emergent is that the residual actually existed in past practice, and thus can be excavated through examination and study, whereas the emergent only exists as a process of coming into being, and is thus always a matter of ‘finding new forms or adaptations of form’ (Raymond Williams, p. 126). To which I would respond that it is in fact *only* adaptations of form that are ever possible or productive because it is through modification rather than outright invention that the complex adaptive system of society feeds information back into itself.

Emergence arises not in some abstract ether of pure invention, but rather in the soil fertilized by actual past practices, processes, and interactions, especially those areas of practice that the dominant seeks to ‘assign as private or to specialize as aesthetic or to generalize as natural’ (Raymond Williams, p. 125). The natural, the private, and the aesthetic: a telling trio, especially when we expand the domain of the private to include the obscene, those practices that occur *ob skene* or ‘off stage’ — behind the doors of bedrooms and closets, metaphorical or otherwise. The residual, in other words, constitutes a kind of conceptual compost, from which the emergent will grow. Walter Benjamin thought of cultural artefacts as fossils, such that ‘the trace of living history [...] can be read from the surfaces of the surviving objects’.<sup>42</sup> Coupling Williams’s framework to more recent theorizations of emergence as a property of complex adaptive systems offers a means to formalize, or perhaps more accurately *proceduralize*, Benjamin’s conviction that such residual meanings remain active not merely in the present but also in the constitution of the future. It becomes a means of fostering transhistorical community out of what Haraway would call the ‘compost’ — whether linguistic, lithic, or biological — that

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<sup>42</sup> Susan Buck-Morss, *The Dialectics of Seeing: Walter Benjamin and the Arcades Project* (Cambridge, MA: MIT Press, 1991), p. 56.

constitutes our entanglement with other beings (*Staying with the Trouble*, pp. 134–68).

When Ruskin turns back to the aesthetic tradition running from Homer to Byron, then, he is not simply looking for evidence of the ‘storm-cloud’ in the prosaic sense of whether or not it existed; he is also looking for the forms and language in which to conceptualize it. He is looking for the new insights that those works can help to generate in a future that lies beyond the horizon of what their creators could have envisioned, which is also what I am doing to him. This, indeed, is one of the key strengths of the idea of conceptual emergence. It helps us think, talk, and indeed participate in the future of the cultural artefacts we study without slipping into teleology or determinism. And it does so by focusing on ecocultural adaptation as a process in which dynamics and patterns become visible, rather than on the specific entities in question. This double movement fits within the broad pattern in nineteenth-century thought that Devin Griffiths describes as ‘comparative historicism’, a way of writing about the past that moves ‘*between* histories’ in order to ‘articulate history as a tense composite rather than an organic whole’ (p. 15, emphasis in original). This is a vital distinction, because it does not ‘foreclose the sense that things could have been otherwise’, thus disrupting the work of the historical unconscious, and because, as Griffiths explains, the ‘no-analog future’ posed by climate change presents ‘comparative historicism writ large and with the highest possible stakes’ insofar as we now find ourselves in the position of drawing analogies ‘between the no-analog future and the no-analog past’ (pp. 15, 259). The work of history in the Anthropocene is thus not simply to uncover the all-too-common instances of ecological devastation in the past, or even to ask whether the participants understood the implications of their actions (they often did), but rather to find in that encounter those excluded, decried, or trivialized residues from which an alternative vision of modernity can emerge.

Consider Ruskin’s predicament in this context. The idea of a climatic phenomenon imbued with meaning could not be expressed or even thought within the dominant cultural mode of ‘your modern beliefs’. Thus, to present the significance of the storm-cloud he had to find a way to get outside the purview of those beliefs, to advance an alternative thesis that required his audience not simply to embrace a novel idea but to examine a concept that was quite literally impossible within their conception of reality. Ruskin’s turn back to the ‘men of old time’ constitutes an attempt to reach outside the dominant framework of the Modern Constitution to those residual structures of belief that remain active within it as *forms*, or patterns, even if they have been dismissed as entities, a turn in keeping with Caroline Levine’s argument about how forms persist over time, which means they can be put to uses diametrically opposed

to the ones they initially served.<sup>43</sup> Ruskin's search for the residual would be easily misunderstood as a turn to the archaic if not for his recurrent insistence that the storm-cloud is genuinely 'unrecorded in the courses of nature'. If the phenomenon is in fact utterly new then the old beliefs will also perforce be inadequate to understand it, in much the same way as the Anthropocene both conforms to and exceeds the age-old narrative of human impact on the environment. Ruskin thus turns back to the men of old time not in order to resuscitate the old beliefs in any simple sense but to gather material from which to fashion an emergent concept because he recognizes that whatever the storm-cloud is, it is essentially outside the dominant framework of 'your modern beliefs' and thus by definition cannot be fully articulated within them. That the response was to mock him for 'madness' speaks to the discipline inherent in the dominant mode, as well as the active disavowal, and even violence, entailed in producing the 'modernizing unconscious'.

While I do not intend to minimize the reality of Ruskin's mental illness or the suffering it caused him, I prefer to treat it as symptomatic rather than diagnostic, even as a form of resistance: the last battleground in his war with industrial modernity, the 'age of reason' bent on killing Nature both physically and imaginatively. Theodore Roszak speaks of the 'ecological unconscious' as the sense of our deep evolutionary roots in nature, awareness that remains repressed in most modern humans, but which can produce psychosis when unfulfilled.<sup>44</sup> Bonneuil and Fressoz's use, meanwhile, shifts unconscious awareness not only of the reciprocally unapparent presence of culture in the wilderness and nature in the city, but of the ecological impact of our actions, or, perhaps more usefully, of the historical processes within which we are embedded. Rather than (or in addition to) the affinity with nature suppressed by industrial modernity, the ecological unconscious must also encompass the trauma of destruction, the effluence hidden within the very fabric of the Modern Constitution. It thus stands for the ghostly realm where our waste resides, whether the detritus of psychological trauma or carbon accumulating in the atmosphere; these are ghosts to whom we must listen because they trouble the notion that this future in which we live is the only one, unsettling our modern beliefs in the inevitability of the Anthropocene. As Jedediah Purdy argues, the Anthropocene lies beyond any form of democratic politics or legislative body that we have yet developed:

<sup>43</sup> Caroline Levine, *Forms: Whole, Rhythm, Hierarchy, Network* (Princeton: Princeton University Press, 2015).

<sup>44</sup> Theodore Roszak, *The Voice of the Earth: An Exploration of Ecopsychology* (Grand Rapids: Phanes, 1992), p. 301.

No one really knows what a democracy on the scale of Anthropocene challenges [...] would look like. To write of a 'we,' a polity that could inhabit and constitute such a democracy, in the absence of the institutions and shared identities that would make it real, is to write fiction, imaginative literature.<sup>45</sup>

While hardly one to disparage fiction (or the future), I would like to add that such writerly community building depends not only on imagination and invention but also on resuscitation. It is not only the task of the novelist, but also that of the historian. Because, as Benjamin reminds us in an injunction that grows ever more apt in an age of extinction, '*even the dead* will be safe from the enemy, if he wins. And this enemy has not ceased to be victorious.'<sup>46</sup> Our vigilance must not cease, even if we suspect that, this time, the enemy is ourselves.

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<sup>45</sup> Jedediah Purdy, *After Nature: A Politics for the Anthropocene* (Cambridge, MA: Harvard University Press, 2015), p. 268.

<sup>46</sup> Walter Benjamin, 'Theses on the Philosophy of History', in *Illuminations: Essays and Reflections*, trans. by Harry Zohn (New York: Schocken Books, 2007), pp. 253–67 (p. 255).