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British Romanticism and the Global Climate

The development of meteorological science during the eighteenth century made possible for the first time reasonably accurate comparisons between the climates of different parts of the world. These comparisons were mobilised to support typologies of racial and cultural difference. As scholars such as Jan Golinski have shown, eighteenth-century and Romantic writers were often concerned with the relationship between climate and civilisation.[1] The supposedly inferior climates of some countries and regions were used to argue for the value of their 'improvement' through colonisation. Ideas about climate, therefore, were highly political and connected to the interests of nation-states and powerful organisations such as the East India Company. However, the early nineteenth century also saw the emergence of a nascent idea of climate as a dynamic *global* system. The relatively systematic measuring of weather for the first time not only allowed for comparison between different regions, but also for the mapping of climate 'across national boundaries'.[2] (A key stage in this process was Alexander von Humboldt's invention of the isotherm in 1817.[3]) While meteorology was opening up new ways of understanding global space, rapid developments in geoscience were revolutionising ideas about the Earth's history. For influential figures such as the Comte de Buffon and Georges Cuvier, the planet was not a stable environment, but subject to sudden geological and climatic disruptions over a much deeper chronology than had hitherto been imagined. Romantic visions of global climate change were inevitably inflected by providential and apocalyptic religious discourses, but also included a more scientific and secular element that opened up the possibility of an end to the human species without any sort of eschatological recompense.

The origins of modern climate science have often been identified in the 1830s, with the work of Jean Louis Rodolphe Agassiz to develop an Ice Age theory.[4] But there were earlier scientific speculations about the global climate. In 'Les époques de la nature' (1778) and other later works, Buffon described how the planet had undergone a process of gradual cooling since its creation and imagined an icy future in which it would be rendered uninhabitable.[5] However, he also suggested that global cooling might be at least temporarily delayed, or even reversed, by human cultivation of the earth: 'the draining, clearing, and peopling a country will give it a

[1] Jan Golinski, *British Weather and the Climate of Enlightenment* (Chicago: The University of Chicago Press, 2007), chapter 6.
[2] Mike Hulme, *Weathered: Cultures of Climate* (London: Sage, 2017), p. 20.
[3] Andrea Wulf, *The Invention of Nature* (London: John Murray, 2015), pp. 177-9.
[4] Mike Hulme, *Why We Disagree About Climate Change* (Cambridge: Cambridge University Press, 2009), p. 41.
[5] Martin Rudwick, *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution* (Chicago: University of Chicago Press, 2005), pp. 142-9.

warmth which will continue for some thousand years'.[6] Buffon's global cooling theory had some literary influence, as I will suggest below, but was not generally accepted by natural philosophers. For example, Joseph Fourier's ground-breaking essay 'On the Temperatures of the Terrestrial Sphere and Interplanetary Space' (1827) argued that future changes to the interior heat of the planet would have no effect on its surface temperature, which he believed was dependent on solar energy and the general temperature of interplanetary space.[7] It was, however, generally accepted that human activities could 'improve' the climate at a regional level and some thinkers even envisaged Anthropogenic climate change on a planetary scale. . In the *Botanic Garden* (1792), for example, Erasmus Darwin argued that the European nations should unite in a project to tow icebergs to the tropics, thereby producing a more balanced and comfortable global climate for everyone.[8] Utopian discourse on global climate change in the Romantic period reaches its apex in the poetry of Percy Bysshe Shelley. In *Queen Mab* (1813) and *Prometheus Unbound* (1820), a climatic shift into an eternal spring or summer signifies the world's socio-political liberation and the perfectibility of humanity.[9]

This chapter, however, addresses more troubled Romantic visions of the global climate. I focus on textual responses to two periods of short-term climate disruption caused by the volcanic eruptions of Laki in 1783 and Tambora in 1815.[10] My case studies reflect not only on how Romantic-period writers responded to particular meteorological conditions, but also on how they began to imagine climate as an interconnected system in which changes in one region of the world could affect other regions. These texts entangle scientific, political, and religious discourses around weather and climate. In particular, they combine empirical observation of localised phenomena with apocalyptic forebodings that invoke the Bible and *Paradise Lost*. I offer my analysis as part of the ongoing critical project of constructing a genealogy for thinking about climate in the Anthropocene. While the present-day environmental crisis may well require new ways of thinking, understanding the Anthropocene as a kind of epistemological breach risks dehistoricising climate change and presenting it as the inevitable result of human 'progress',

[6] Georg-Louis Buffon, *Natural History, General and Particular*, trans. William Smellie, 9 vols (London: A. Strahan and T. Cadell), 3rd edition, IX, 396.
[7] Fourier's essay can be found online at https://geosci.uchicago.edu/~rtp1/papers/Fourier1827Trans.pdf. For a fine discussion of the essay, see Jerome Whitington, 'The terrestrial envelope: Joseph Fourier's geological speculation', in Tom Bristow and Thomas H. Ford (eds), *A Cultural History of Climate Change* (London: Routledge, 2016), pp. 55-71.
[8] For a more detailed account of Darwin's plan, see Siobhan Carroll, 'Crusades Against Frost: *Frankenstein*, Polar Ice, and Climate Change in 1818', *European Romantic Review*, 24 (2013), 211-30 (pp. 213-215).
[9] See Eric Gidal, '"O Happy Earth! Reality of Heaven!": Melancholy and Utopia in Romantic Climatology', *Journal for Early Modern Cultural Studies*, 8 (2008), 74-101.
[10] For a fuller account of the Tambora eruption and British Romanticism, see my book *British Romanticism, Climate Change, and the Anthropocene: Writing Tambora* (London: Palgrave, 2017).

rather than as the result of a wide range of contingent factors.[11] A better understanding of the complex interactions of climate and culture in the past may contribute to a better understanding of our current predicament and to the remarkable persistence of apocalyptic rhetoric around climate change within an ostensibly secular context.

The Laki Eruption of 1783

In June 1783 a system of volcanic fissures around Mount Laki in Iceland began an eruption that would last for eight months. 'The largest-known lava-flow eruption of the last millennium', it produced something like 15 cubic kilometres of lava, and an estimated 122 megatons of sulphur dioxide, as well as large amounts of other gases.[12] The lava did not directly affect populated areas, but led to famine and fluoride poisoning that is thought to have killed around 10,000 people; that is, about 20% of Iceland's population at the time. The resulting toxic smog spread throughout Europe in the summer of 1783, causing respiratory problems and thousands of deaths. (For example, William Cowper noted that 'such multitudes are indisposed by fevers in this country, that the farmers have with difficulty gather'd in their harvest, the laborers having been almost every day carried out of the field incapable of work, and many die'.[13]) That summer was unusually hot and was also marked by other strange phenomena, such as a major earthquake in Italy (killing around 30,000 people) and meteor sightings, followed by a severely cold winter that the eruption probably caused.[14] It is hardly surprising that some people looked for religious explanations, fearing that the Day of Judgement was at hand. However, natural philosophers suggested other causes, and several made the connection between the haze and volcanic activity. Benjamin Franklin, for example, postulated that the haze might be caused by 'the vast quantity of smoke, long continuing to issue during the summer from Hecla in Iceland, and that other volcano that arose out of the sea near that island, which smoke might be spread by various winds over the northern part of the world'.[15] In an example of the nascent scientific interest in climate

[11] For the Anthropocene as breach, see Timothy Clark, *Ecocriticism on the Edge: The Anthropocene as a Threshold Concept* (London: Bloomsbury, 2015). The literature around history and the Anthropocene is too vast to cite here, but for an interesting recent discussion of Romanticism, historicism, and the Anthropocene, see Devin Griffiths, 'Romantic Planet: Science and Literature within the Anthropocene', *Literature Compass*, 14 (2017).
[12] For an overview of the eruption and its effects, see Clive Oppenheimer, *Eruptions that Shook the World* (Cambridge: Cambridge University Press, 2011), chapter 12.
[13] William Cowper, letter to William Unwin 7 September 1783, in *The Letters and Prose Writings of William Cowper*, ed. James King and Charles Ryskamp, 5 vols (Oxford: Clarendon Press, 1979-1986), II, 157.
[14] Laki may also have contributed to the very hot summer in Europe in 1783, although its effects on the global climate are still debated: see Alexandra Witze & Jeff Kanipe, *Island on Fire* (London: Profile, 2014), chapter 6.
[15] Benjamin Franklin, 'Meteorological Imaginations and Conjectures', quoted in Witze and Kanipe, p. 127.

as a complex global system, Franklin also suggested that the haze might have diminished the warming power of the sun's rays and thus led to the severe winter of 1783-4.

The Laki haze was described by several British writers of the period, although none of them knew of its cause. Writing to Lady Ossory in July, Horace Walpole remarks on the 'constant mist that gives no dew, but might as well be smoke':

> I wish modern philosophers had not disturbed all our ideas! two hundred good years ago celestial and terrestrial affairs hung together, and if a country was out of order, it was comfortable to think that planets ordered or sympathized with its ails. A sun shorn of his beams, and a moon that only serves to make darkness visible, are mighty homogeneal to a distracted state.[16]

Walpole contrasts a scientific materialist understanding of the operations of nonhuman nature as separate from human life with a religious or magical discourse that connects 'celestial and terrestrial affairs'. His prose reflects that attraction of the latter mode of thinking by economically conflating the personal, political, and the climatological. The 'distracted state' refers both to the feelings of the observing subject who seeks a kind of ironic reassurance in strange meteorological phenomena, and to the disordered body politic that such phenomena parallel. In describing the sun and the moon, he alludes to two famous passages from Book One of *Paradise Lost*. Eighteenth-century writers often reached for Milton when they wanted to invoke the sublime, but it is worth paying some attention to the specifics of Walpole's allusions. Early on, Milton describes how the 'dungeon horrible' in which Satan and his 'horrid crew' are imprisoned is lit by 'darkness visible' produced by the flames of a 'great furnace'.[17] Walpole's use of Milton's paradoxical expression suggests a hellish disruption to a normally conducive season. (It is possible that the haze's sulphurous smell may also have evoked Hell.) Later in Book One, Satan's partial ruination and the occlusion of his inner light is compared to that of a sun covered by mist or eclipsed by the moon:

> as when the sun new-ris'n
> Looks through the horizontal misty Air
> Shorn of his beams, or from behind the moon
> In dim eclipse disastrous twilight sheds

[16] Horace Walpole, letter to Lady Ossory 15 July 1783, in *Horace Walpole's Correspondence with The Countess of Upper Ossory*, ed. W. S. Lewis *et al.* (London: Oxford University Press, 1965), pp. 404-5.
[17] John Milton, *Paradise Lost*, ed. Alastair Fowler, 2nd edition (London: Longman, 1998), pp. 62-64 (I. 51-63).

> On half the nations, and with fear of change
> Perplexes monarchs.[18]

Alastair Fowler writes that the eclipse 'presages doom for creation in general and the sun king Charles in particular'.[19] The aptness of Milton's lines in 1783 is reflected in Walpole's implication that the nation is 'out of order': a widespread view after Britain's defeat in the American Revolutionary War. However, his witty reference to the modern disconnection between the 'celestial' and 'terrestrial' allows him to invoke Milton's apocalyptic discourse without fully endorsing it.

Gilbert White, pottering around in his Selborne garden, made the same allusion to Milton in his *Naturalist's Journal* for 24 June 1783: 'The sun, "shorn of his beams" appears thro' the haze like the full moon'.[20] He developed further the idea of the relationship between climate and apocalypse in the penultimate letter (to Daines Barrington) of *The Natural History of Selborne* (1789):

> The summer of the year 1783 was an amazing and portentous one, and full of horrible phaenomena; for besides the alarming meteors and tremendous thunder-storms that affrighted and distressed the different countries of this kingdom, the peculiar haze, or smokey fog, that prevailed for many weeks in this island, and in every part of Europe, and even beyond its limits, was a most extraordinary appearance, unlike anything known within the memory of man [...] The sun, at noon, looked as blank as a clouded moon, and shed a rust-coloured ferruginous light on the ground, and floors of rooms; but was particularly lurid and blood-coloured at rising and setting [...] The country people began to look with superstitious awe at the red, louring aspect of the sun; and indeed there was reason for the most enlightened person to be apprehensive; for, all the while, Calabria and part of the isle of Sicily, were torn and convulsed by earthquakes; and about that juncture a volcano sprung out of the sea on the coast of Norway.[21]

[18] Milton, p. 97 (I. 594-9).
[19] Ibid.
[20] Gilbert White, *The Journals of Gilbert White*, ed. Richard Mabey, 3 vols (London: Century, 1988), II, ed. Francesca Greenoak, 465.
[21] Gilbert White, *The Natural History of Selborne*, ed. Richard Mabey (London: Penguin, 1987), p. 265.

For a book associated with a strong sense of place, it is notable that *Selborne* ends by evoking 'horrible phenomena' that spread beyond local and national boundaries.[22] White leaves it open as to whether the earthquakes and new volcano are connected to the 'peculiar haze', but certainly implies that there is something ominous, perhaps even apocalyptic, in their coincidence. As Stuart Peterfreund has argued, despite White's emphasis on empirical observation in natural history, he was also working within a tradition of natural theology. Peterfreund identifies a significant tension between Selborne as 'the type of an unchanging earthly Paradise' and a sense of 'temporal change' in the apocalyptic language used to describe meteorological phenomena.[23] He finds echoes of the passage above in the Book of Revelation.[24] However, its most direct allusion is actually to the Gospel of Matthew:

> When it is evening, ye say, It will be fair weather: for the sky is red. And in the morning, It will be foul weather to day: for the sky is red and lowring. O ye hypocrites, ye can discern the face of the sky; but can ye not discern the signs of the times?[25]

Here Jesus is addressing the Pharisees and the Sadducees, who have asked him to give them a sign from heaven to prove that he is the Son of God. Whereas for Walpole, modernity had sundered the relationship between weather ('the face of the sky') and history ('the signs of the times'), White suggests that the two may remain connected. He goes on to quote 'Milton's noble simile of the sun' (the five lines from *Paradise Lost* addressed above) as 'particularly applicable' due its connection between 'strange and unusual phaenomena' and 'a superstitious kind of dread'. The line between ignorant superstition and enlightened apprehension is distinctly fuzzy, for both involve a 'fear of change' and a kind of perplexity that affects everyone, from 'monarchs' to the 'enlightened person' to 'country people'.[26] *The Natural History of Selborne*, so often associated with a vision of England as a kind of static Eden, ends by invoking environmental and political crisis.

A week after White evoked Milton in his *Naturalist's Journal*, William Cowper, 100 miles away in Olney, made the same reference in a letter to his friend John Newton: 'We never see the

[22] For local and global in White, see Tobias Menely, 'Traveling in Place: Gilbert White's Cosmopolitan Parochialism', *Eighteenth-Century Life*, 28 (2004), 46-65.
[23] Stuart Peterfreund, "'Great Frosts and … Some Very Hot Summers": Strange Weather, the Last Letters, and the Last Days in Gilbert White's *The Natural History of Selborne*', in *Romantic Science: The Literary Forms of Natural History*, ed. Noah Heringman (Albany: State University of New York Press, 2003), pp. 85-108 (p. 93).
[24] Peterfreund, p. 99.
[25] Matthew 16.3.
[26] White, *Natural History*, p. 265.

Sun but shorn of his beams […] he sets with the face of a red hot salamander'.[27] As a fervent Evangelical Christian, Cowper was more willing than Walpole or White to interpret the Laki haze in relation to an imminent Day of Judgement. However, his views on this issue were not straightforward. In a slightly earlier letter to Newton, he noted that 'I am and always have been a great Observer of natural appearances, but I think not a superstitious one […] what the God of the Scriptures has seen fit to conceal, he will not, as the God of Nature, publish'.[28] Like White, Cowper seeks to distinguish between enlightened and superstitious responses to unusual meteorological phenomena but, as in *Selborne*, the distinction is fuzzy. The poet notes that the strange appearance of the sun means that

> Some fear to go to bed, expecting an Earthquake, some […] assert with great confidence that the day of Judgment is at hand. This is probable, and I beleive it myself, but for other reasons. [...] Signs in the heavens are predicted characters of the last times, and in the course of the last 15 years I have been a witness of many.[29]

Having sundered the face of the sky and the signs of the times by distinguishing between the 'God of Nature' and the 'God of the Scriptures', Cowper seems keen to put them back together again. In a passage from *The Task* (1785) – probably the most famous literary emergence of Laki – the connection is made very firmly:

> Is it a time to wrangle, when the props
> And pillars of our planet seem to fail,
> And Nature with a dim and sickly eye
> To wait the close of all?[30]

Cowper may be half-recalling the 'dim eclipse' of Milton's passage here. But, in a surprising reversal, the Laki mist is significant not only because of the perplexity it produces in human observers, but also because 'Nature' is itself experiencing the slow death of its own perceptions. The failing 'eye' may primarily be a metaphor for the dimming of the sun, but also suggests a

[27] Letter to John Newton 29 June 1783, in *Letters*, II, 148. For an excellent discussion of Cowper and Laki, see Tobias Menely, '"The Present Obfuscation": Cowper's *Task* and the Time of Climate Change', *PMLA* 127 (2012), 477-92.
[28] Letter to John Newton 13 June 1783, in *Letters*, II, 143.
[29] Letter to John Newton 29 June 1783, in *Letters*, II, 148-9.
[30] William Cowper, *The Task*, in *The Poems of William Cowper*, ed. by John D. Baird and Charles Ryskamp, 3 vols (Oxford: Clarendon Press, 1980-95), II, 140 (II.62-5). Further references to *The Task* are in the text.

more general planetary collapse: as Cowper states in a footnote, the haze is widespread across 'Europe and Asia'.

It is worth paying some attention to the specific context of this passage in Book II of *The Task*, which he described as 'dealing pretty largely in the *signs* of the *times*'.[31] The book starts with a horrified diatribe against war and oppression – 'the natural bond / Of brotherhood is severed' (II. 9-10) – and particularly against the practice of slavery ('human nature's broadest, foulest blot' (II.22)). If the English climate is peculiarly liberating – for 'Slaves cannot breathe in England; if their lungs / Receive our air, that moment they are free' (II. 40-41) – then the nation's participation in the slave trade cannot be justified. Freedom, Cowper suggests, should 'circulate through ev'ry vein' (II. 44) of the British empire, for global fellow-feeling is required now more than ever at a time of environmental crisis, when the 'world' seems 'To toll the death-bell of its own decease / And by the voice of all its elements / To preach the gen'ral doom' (II. 50-52). As well as the Laki haze, he also alludes to the 'late calamities at Jamaica' (a hurricane and a tidal wave), the unusual 'meteors' observed in Britain in August 1783, and (like White) the earthquakes in Sicily and Calabria. The preacherly voice of *The Task*, in contrast to the more sceptical and modest persona of Cowper's letters, understands these phenomena as revealing God's anger at humanity's sins. That 'England' has so far not been badly affected is certainly not a reflection of its purity, for Cowper warns that that there are 'none than we more guilty' (II. 154) and that 'we' need to heed the signs of God's displeasure. In addition to his opposition to the slave trade, Cowper was also concerned by the British empire's oppressive presence in India, and interpreted the loss of the American colonies as another sign of divine displeasure with the nation's despotic and luxurious excesses.[32] And yet if the sins of Britain and other nations are contributing to the collapse of the global climate, *The Task* finds solace in a more localised vision of the 'fickle' but nonetheless lovable English 'clime', 'deform'd / With dripping rains, or wither'd by a frost' (II. 210-11). As so often in Cowper's work, England is imagined as a localised 'nook' (II. 207) in which he can retreat from his wider fears, even if it is threatened by corruption. His understanding of climate is more obviously moralistic, theological, and apocalyptic than that of Walpole and White. But, like them, he understands the Laki haze in the context of national and global crisis. Milton offered a powerful model for all three writers as a way of reflecting on the entanglements of climate and human activity, rather than their separation.

[31] Letter to John Newton 11 December 1784, in *Letters*, II, 309.
[32] For nation and empire in Cowper, see my book *Romantic Englishness: Local, National, and Global Selves, 1780-1850* (London: Palgrave, 2014), chapter one.

The Tambora Eruption of 1815

In the evening of 5 April 1815, the inhabitants of Java heard a number of explosions that continued intermittently until the following day. At first they were 'almost universally attributed to distant cannon', but in fact this was the opening salvo in the eruption of Mount Tambora on the isle of Sumbawa, hundreds of miles to the east.[33] A hazy atmosphere and slight fall of ash followed over several days. At about 7 pm on 10 April, the mountain blew up. According to an eyewitness account, 'three distinct columns of flame burst forth near the top […] In a short time the whole Mountain […] appeared like a body of liquid fire extending itself in every direction'.[34] The explosions could be heard over 2,000 kilometres from the eruption. Due to the huge amounts of volcanic material emitted, 'many places within a 600-kilometre radius remained pitch black for a day or two' and the ash fall affected a much larger area.[35] This was one of the very largest documented eruptions of the Holocene epoch and it had devastating consequences for local populations. It wiped out the kingdom of Tambora, and the ash destroyed agriculture and contaminated drinking water across Sumbawa and nearby islands. The exact death toll from the explosions, pyroclastic currents, tsunami, and local famine and disease is impossible to know, but plausible estimates put it at between 60,000 and 120,000 people across Sumbawa, Bali, and possibly other parts of the archipelago such as Lombok and eastern Java.[36] The huge amount of sulphur released into the atmosphere formed a sulphuric acid aerosol, leading to a global cooling of between one and two degrees centigrade (strongest in the northern hemisphere) and severe climatic disruption in the period from 1816 to 1818.[37] In particular, 1816 became known in Europe and North America as the 'Year without a Summer' due to unseasonably cold and wet weather.[38] Following the ground-breaking work of John D. Post, scholars have identified Tambora as a key factor in the harvest failures and food scarcities across the globe in the late 1810s, and perhaps even the typhus and cholera epidemics of the period.[39] The history of the eruption shows on a global scale the catastrophic consequences of a powerful natural hazard in combination with large numbers of people made vulnerable by their poverty.

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[33] [Charles Assey], 'Narrative of the Effects of the Eruption from the Tomboro Mountain, in the Island of Sumbawa, on the 11th and 12th of April 1815', *Transactions of the Batavian Society, of Arts and Sciences* 8 (1816): 3-4.
[34] [Assey], p. 23.
[35] Oppenheimer, pp. 302-3.
[36] Oppenheimer, p. 311.
[37] J. Kandlbauer, P. O. Hopcroft, P. J. Valdes, and R. S. J. Sparks, 'Climate and carbon cycle responses to the 1815 Tambora volcanic eruption', *Journal of Geophysical Research: Atmospheres*, 118 (2013), 12497-12507.
[38] For the weather conditions in Britain in 1816, see Lucy Veale and Georgina H. Endfield, 'Situating 1816, the "year without summer", in the UK', *The Geographical Journal*, 182 (2016), 318-30.
[39] John D. Post, *The Last Great Subsistence Crisis in the Western World* (Baltimore and London: The Johns Hopkins University Press, 1977) and also Gillen D'Arcy Wood, *Tambora: The Eruption that Changed the World* (Princeton: Princeton University Press, 2014).

Tambora's impact on British Romanticism is principally apparent in the works of Byron and the Shelleys written or conceived during the literary *annus mirabilis* of 1816, but it also appears in other texts of the period.[40] Due to the short interregnum from 1811 to 1816 during which Britain was in control of Java, the principal source for eyewitness accounts of the eruption and its aftermath is an English-language document collected together under the auspices of Sir Stamford Raffles, the island's governor during this period. Scholars have tended to treat this text as a straightforward source of information about the eruption and its effects. However, it is in fact a heteroglossic and collaborative production that emerges from a particular historical moment. It is dated 28 September 1815, and so we might reasonably assume that it was composed during that month. During 1814 and 1815, the Raffles administration existed in an unstable geopolitical context. Java had been returned to the Dutch by the Anglo-Dutch Treaty of August 1814. A year later, news arrived on Java of Napoleon's escape and resurgence, which potentially voided the Treaty and excited Raffles with the possibility of a longer British presence in Java. And yet in September he received the devastating news that he was likely to be dismissed from office. The sense of political crisis is apparent in the narrative's description of the weather on Java following the initial explosions:

> From the 6th, the sun became observed: it had every where the appearance of being enveloped in fog, the weather was sultry and the atmosphere close and still; the sun seemed shorn of its rays, and the general stillness and pressure of the atmosphere foreboded an Earthquake.[41]

This account alludes, rather gracefully, to the passage in Book 1 of *Paradise Lost* also referenced by Walpole, Cowper, and White. It connects the mist-covered sun (and the potential 'Earthquake') to a catastrophic overturning of the normal state of things – as indeed it was – and, more specifically, it connects meteorological phenomena to political ones. The invocation of the Miltonic sublime might seem to emphasise the status of the document as a product of elite Western culture. But it also connects the imperialistic metanarrative to the more localised indigenous accounts that the document also reports, and that read sudden environmental change as signalling some change in the political realm.

Many of the eyewitness reports collected in Raffles's document registered the peculiar intensity of the 'unusually thick darkness' caused by the ash fall. The captain of an East India

[40] For Byron, the Shelleys, and Tambora, see Higgins, *British Romanticism and Climate Change*, chapter 3 and Wood, chapter 3.
[41] [Assey], p. 4.

Company cruiser reported that by noon on 12 April, 'complete darkness covered the face of the day', noting that he had never seen 'saw any thing equal to it in the darkest night—it was impossible to see your hand when held up close to your eyes'. This 'darkness visible' was also emphasised by Raffles when he introduced a reprinted version of the narrative in his *History of Java* (1817): 'the sky was overcast at noon-day with clouds of ashes, the sun was envelloped in an atmosphere, whose "palpable" density he was unable to penetrate'.[42] By putting 'palpable' in quotation marks, Raffles signifies that it in allusion, and there are two relevant passages in *Paradise Lost*. An account in Book XII of the ten plagues of Egypt includes the following lines: 'Darkness must overshadow all his bounds, / Palpable darkness, and blot out three days'.[43] Raffles's account of the eruption tends to avoid providential readings of environmental catastrophe, but the apocalyptic connotations of the ash fall are registered here. A more complex connection can be found to the scene in Book II in which the devils in Pandaemonium are debating the best course of action. Beezlebub, Satan's mouthpiece, suggests taking vengeance on God by corrupting the world that he has created:

> But first whom shall we send
> In search of this new world, whom shall we find
> Sufficient? Who shall tempt with wandering feet
> The dark unbottomed infinite abyss
> And through the palpable obscure find out
> His uncouth way, or spread his airy flight
> Upborne with indefatigable wings
> Over the vast abrupt, ere he arrive
> The happy isle.[44]

'The happy Isle' is Earth, the 'new world' created by God with his favoured creatures in it. Penetrating the dark abyss – 'the palpable obscure' – between Pandaemonium and Earth will lead Satan into Eden. Raffles's *History of Java* is in part an attempt to argue for a permanent British colonial settlement there. The reader has to see through the dark veil of Tambora – an epistemological as well as a sensory phenomenon – if they are to arrive at an understanding of the colonial potential of the 'happy Isle' as a fertile paradise. The volcano threatens the abyssal

[42] Thomas Stamford Raffles, *The History of Java*, 2 vols (Kuala Lumpur: Oxford University Press, 1965), I, 25-6. Reprint of 1817 edition.
[43] Milton, p. 655 (XII. 187-8).
[44] Milton, p. 129 (II. 402-10).

and destructive, but it can also be transcended and controlled by a 'sufficient' and 'indefatigable' colonialist such as Raffles.

The reach of the Tambora eruption was truly global. Despite its widespread cooling effects, it actually led to warming in the Arctic and a temporary decrease in sea ice.[45] Writing to Andrew Bell in February 1818, Robert Southey notes that no 'public matters' interest him as much as 'the revolution about the North pole, & the breaking up of the ice'. He suggests that it is likely that 'earthquakes & volcanos have caused the disruption of the ice, – the combustibles which used to explode in Iceland have probably broken out nearer the pole'. As with many writers in the period, Southey's understanding of climate was more geomorphic than atmospheric. He concludes that 'these speculations interest me as much as a continental war, or a Spafields mob, & a great deal more than the preparations for a Westmorland election'.[46] Southey's distinction between the political and climatological realms breaks down when viewed in the light of modern scholarship on Tambora's effects. Spa Fields was the site of a large reformist meeting in December 1816, which ended in disorder, and contributed to the passing of the Seditious Meetings Act and the suspension of Habeas Corpus in 1817. There is no doubt that the climate disruption caused by Tambora was a significant factor in the so-called 'distresses' that affected many of the poorer inhabitants of Britain in the late 1810s and which led to intense political debate and public unrest.[47]

The decrease in the Arctic ice was widely reported in the press, but a key influence on Southey's excitement was his fellow contributor to the conservative *Quarterly Review*, Sir John Barrow (who was also second secretary to the Admiralty). From 1816, Barrow successfully used his journalistic platform to promote the value of Arctic exploration. A particularly important article, published in February 1818, addressed the possibilities opened up by the recent ice-melt, and in particular the potential warming of the British climate, access to Greenland, and the discovery of the Northwest Passage. As Adeline Johns-Putra has shown, Barrow's article was a significant influence on Eleanor Anne Porden's poem *The Arctic Expeditions* (1818).[48] Porden emphasises how 'Science' will inspire heroic Britons to penetrate the new spaces opened up by the melting ice and to rediscover the 'long lost country' of Greenland, which in future will

[45] Wood, chapter 6.
[46] Robert Southey, letter to Andrew Bell 17 February 1818, in *The Collected Letters of Robert Southey: A Romantic Circles Electronic Edition: Part Five: 1816-1818*, ed. Tim Fulford, Ian Packer, and Lynda Pratt, https://www.rc.umd.edu/editions/southey_letters/Part_Five/HTML/letterEEd.26.3083.html#back14, paragraph 4.
[47] For the Regency crisis, see Post and R. J. White, *Waterloo to Peterloo* (Harmondsworth: Penguin, 1957).
[48] Adeline Johns-Putra, 'Historicizing the Networks of Ecology and Culture: Eleanor Anne Porden and Nineteenth-Century Climate Change', *Interdisciplinary Studies in Literature and Environment*, 22 (2015), 27-46.

experience 'milder summers'.[49] Furthermore, the British climate will also be improved: 'our happier clime / Again shall hail returning Summer's prime; / Its ruddy grapes shall lavish Autumn bring'.[50] Like Barrow, Porden predicts the improvement in the national climate as a return ('again') to a warmer period, as found in 'the descriptions of our elder poets'.[51] The opening up of the Arctic offers a kind of apocalypse: an 'unveiling' of a glorious future that reprises a glorious past. Cowper had found solace in the idea of a 'fickle' but lovable national climate that offered a kind of bulwark against imperial corruption and chaos. In contrast, Barrow and Porden understand global climate change as an opportunity for imperial self-aggrandisement and, like Robert Walton and Victor Frankenstein, emphasise the power of human beings to conquer recalcitrant elemental forces.

I conclude this essay with the contrary vision of Byron's 'Darkness': an account of the total collapse of the global climate system, which offers the most radical of all the textual responses to Tambora. The poem's prophetic narrator allows us to experience 'darkness visible' by describing a future Earth unlit by the sun's rays:

> The bright sun was extinguish'd, and the stars
> Did wander darkling in the eternal space,
> Rayless, and pathless, and the icy earth
> Swung blind and blackening in the moonless air.[52]

As the words 'rayless', 'pathless', and 'moonless' suggest, the poem is defined by absence, loss, and confusion. The image of the earth swinging blindly through the air suggests a movement that deviates from its normal orbital trajectory. The usual order of the universe has collapsed; the darkening of the sun is mirrored by the other stars which now wander without a clear path. The Enlightenment's sundering of climate and history, as identified by Walpole, is treated with brutal irony by Byron. The poem presents a celestial and climatic system on which human beings are entirely dependent, but which is entirely careless of human life. The resulting poem is dizzyingly nihilistic and atheistic, presenting religion as irrelevant and existence as a feeble joke:

> The crowd was famish'd by degrees; but two
> Of an enormous city did survive,

[49] Eleanor Anne Porden, *The Arctic Expeditions: A Poem* (London: John Murray, 1818), pp. 12-13.
[50] Porden, p. 13.
[51] Ibid.
[52] Lord Byron, *The Complete Poetical Works*, ed. Jerome McGann, 7 vols (Oxford: Clarendon Press, 1980-93), IV, 40, ll. 2-5.

> And they were enemies; they met beside
> The dying embers of an altar-place
> Where had been heap'd a mass of holy things
> For an unholy usage; they rak'd up,
> And shivering scraped with their cold skeleton hands
> The feeble ashes, and their feeble breath
> Blew for a little life, and made a flame
> Which was a mockery.[53]

It is tempting to read this as a moment of self-reflexivity. After all, Byron's poem 'heaps' together religious allusions for irreligious purposes and offers a 'mockery' of human aspirations to control the environment.[54] Like his contemporaries, Byron did not know of the relationship between Tambora and the global climate. The poem's influences are diverse, from the wet and stormy weather of 1816, to various apocalyptic passages in the Bible, to the European sun-spot panic of the same year. Byron's understanding of the catastrophist geoscience of Cuvier and Buffon was also significant. The latter's global cooling theory was explicitly referenced by Percy Bysshe Shelley when responding to glacial augmentation in the vale of Chamonix in July 1816, and had a notable impact on two of the most significant Romantic texts of the period: 'Mont Blanc' and *Frankenstein*. The problem in Byron's poem is the cooling of the sun rather than of the Earth, but the endpoint is the same: an uninhabitable planet. The end of the poem reveals darkness to be much more than an absence of light: rather, 'she' is a powerful – indeed, a 'palpable' – agent.

The question of agency is fundamental to current debates around climate change. One key criticism of the concept of the Anthropocene is that it implies a species-wide responsibility for global warming, rather than focusing on those countries that have benefited the most from the carbon-fuelled capitalism that emerged in Britain at the end of the eighteenth century. Another criticism is that it exaggerates human agency and downplays that of nonhuman creatures and forces. Understood simply as a stratigraphic marker, of course, the term does neither of these things and, indeed, the scientific literature around the Anthropocene is often more nuanced than humanities scholars like to suggest.[55] It seems to me that the real problem is not with the concept itself, but rather with simply making sense of a period of unprecedented

[53] Ibid., IV, 42, ll. 55-64.
[54] Catherine Redford gives a useful account of the poem's Biblical allusions, although I disagree with her conclusions: '"No love was left": The failure of Christianity in Byron's "Darkness"', *Byron Journal*, 43 (2015), 131-40.
[55] For a useful discussion, see Ian Angus, *Facing the Anthropocene: Fossil Capitalism and the Crisis of the Earth System* (New York: Monthly Review Press, 2016), especially pp. 224-32.

human impacts on the earth system. The Romantics found in Milton a useful way of thinking about climate and culture because, whatever scientific advances had occurred since the late seventeenth century, his understanding of the intertwining of 'celestial and terrestrial affairs' still resonated. Similarly, and despite the significant changes wrought by two centuries of fossil capitalism, Romantic writing offers a valuable genealogy for present-day thinking about the global climate in the Anthropocene. The utopian schemes of contemporary geoengineers have their analogues in the Romantic period, as do the bleakest prognostications of modern-day doomsayers.[56] Despite remarkable advances in climate science and mathematical modelling, predicting how the global climate will behave still involves a large degree of speculation. And apocalyptic thinking remains resilient, even in apparently secular contexts. Perhaps the reality is that the climate can change more quickly than some of the ways in which climate change is framed.

Keywords: Laki, Tambora, Anthropocene, Cowper, Gilbert White, volcanism, Buffon, Milton, Byron.

Abstract: As a result of developments in the meteorological and geological sciences, the Romantic period saw the gradual emergence of attempts to understand the climate as a dynamic global system that could potentially be affected by human activity. This chapter examines textual responses to climate disruption cause by the Laki eruption of 1783 and the Tambora eruption of 1815. During the Laki haze, writers such as Horace Walpole, Gilbert White, and William Cowper found in Milton a powerful way of understanding the entanglements of culture and climate at a time of national and global crisis. Apocalyptic discourse continued to resonate during the Tambora crisis, as is evident in eyewitness accounts of the eruption, in the utopian predictions of John Barrow and Eleanor Anne Porden, and in the grim speculations of Byron's 'Darkness'. Romantic writing offers a powerful analogue for thinking about climate change in the Anthropocene.

[56] I do not use the term 'doomsayers' in a negative sense. My own view is that they are probably right.