Pandaemonium: Narratives of Energy System Change in Historical and Literary Perspective

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Abstract
This essay asks what insights the experiences described, the views expressed, and the imagination of energy in *Pandaemonium*, Humphrey Jennings' anthology of eyewitness accounts of the Industrial Revolution in Britain, afford into the processes and consequences of energy system change, and it explores their significance for the transition to renewable energy today. Conceived as an experiment in interdisciplinary collaboration, it demonstrates how examination of energy narratives from the perspective of the historian (traditionally concerned with processes of change, their causes and consequences, agents and objects), and from that of the literary critic (concerned principally with matters of aesthetics and form, ethics, and the framing of issues through cultural tropes) can complement each other and contribute to research in energy humanities, by enhancing familiarity with historical processes and critical awareness of their framing in narratives.

Keywords: Energy system change; environmental history; literary ecocriticism; Industrial Revolution; Humphrey Jennings; interdisciplinary environmental humanities

The Industrial Revolution was driven by the most significant change in the generation, distribution and consumption of energy in modern times before the decarbonisation of the economy and society on which we have recently embarked, namely the shift from wood, water, wind and muscle power to coal, and its combustion in steam engines. The historical demographer and leading historian of the Industrial Revolution, E.A Wrigley has argued that in the organic economy which prevailed in much of Britain up to the middle of the eighteenth century, production, consumption and population growth were essentially limited by the extent of renewable natural resources in the region. The transition to an inorganic energy regime in the late eighteenth century, characterized by abundant, cheap supplies of coal, enabled Britain to overcome the material limits that had constrained growth in earlier periods, leading to detachment of industrial production from the site of the energy source, advances in technological efficiency and economic growth.[1] In this

narrative of energy system change, a central role is played by, for example, the increased availability of transportable, concentrated energy in the form of coal after Thomas Newcomen's invention of the "atmospheric-engine" in 1712, and its more efficient conversion into power by means of James Watt's improved design later in the century. These changes transformed working practices, and with them people's everyday lives, and social relations in the country.

The overarching story of the Industrial Revolution has traditionally been told as one of the triumph of human labour and invention, as one of progress leading to increased leisure time, which in turn facilitated further scientific discoveries and technical advances, in a virtuous circle and in ever increasing tempo. This was Danny Boyle's general perspective in the opening ceremony of the London Olympic Games in 2012, which told the tale of Britain's rise to a world economic power.[2] (As continuing evidence of Britain's progressive vision and ability to innovate, Boyle followed the Industrial Revolution with the National Health Service and the World Wide Web.) But the many different small stories about this momentous historical development which Jennings collected, and which inspired Boyle's national pageant,[3] have global as well as national implications, and negative as well as positive ones. As the historian Dipesh Chakrabarty has written in a much-cited article, modernity is unthinkable without fossil fuels.[4] And the global reach of coal- and oil-fired modernity today is changing the climate, rendering species extinct and compromising the lives of future generations. Jennings' account of the Industrial Revolution is richer and more complex than Boyle's adaptation, for it gives space to the fragmented and contradictory nature of human experience and interpretation of change. It also enables us to see the current transition from fossil fuels to renewables and the drive for energy efficiency and savings in a historical context. 'Energy,' however, does not feature as such prominently in the book. The need to produce and consume energy is intrinsic to human life and there is a tendency, in the past as today, for it to be overlooked and left uncommented. That said, in many of the passages Jennings collected, energy is present as a force shaping people's relationships and experiences of the physical environment. This essay asks how the experiences described, the views expressed and the *imagination* of energy in *Pandaemonium* relate to our own day, and what lessons might be learned from

them for debates on decarbonisation. Conceived as an experiment in interdisciplinary collaboration under the umbrella of the environmental humanities, it seeks to demonstrate that approaching the stories which Jennings collected from the twin vantage points of historical and literary analysis can contribute to renewed thinking and critical reflection on societal change in general, and energy transition in particular, by enhancing familiarity with historical processes and critical awareness of their framing in narratives.

Master narratives and framings of energy change

Narratives of the Industrial Revolution such as that written and presented by Boyle to a global audience in 2012 offer the public an accessible and palpable past. The apparent democratic inclusiveness of such 'heritage' narratives gives substance to historical continuity and understanding of how we got to where we are today, confirming a perception of history as progressive emancipation from the shackles of nature, through admittedly violent and grim, but all the more heroic processes of industrialization, leading eventually to social equality in a better world. However, different messages can be conveyed in alternative histories. And these have the potential to ignite public engagement on issues such as climate and environmental change. Mark Levene has recently called upon historians, and humanities scholars more generally, to seriously consider the ethics of writing the past and to give space to historical experiences that do not easily fit conventional narratives of historical change and progress.[5] The very notion of industrial 'revolution,' so vividly depicted by Boyle, implies a powerful and unassailable story of economic progress and national greatness founded upon the ingenuity of wealthy white men and the wholesale consumption of cheap and abundant supplies of fossil fuels. We might evoke this past energy transition to instill the idea of change as a real possibility in our own time. But, as most professional historians have been at pains to show, the processes of industrial change are complex, contingent and contentious. (Vaclav Smil has written similarly about the complexity and duration of energy system transitions.[6]) The packaging up and labelling of manifold historical processes as homogenous events, like the 'industrial revolution,' effectively telescopes time, and in so doing conceals the diffuse and highly varied experiences of change in the past.

The origins and nature of the Industrial Revolution are far from being decided. While Wrigley argues that the driving force was energy system change, Joel Mokyr contends that the era of Enlightenment and the emergence of a scientifically informed 'knowledge economy' paved the way for accelerated growth from the mid eighteenth century.[7] Maxine Berg has shown how change and innovation were driven by consumer demand, changing fashions and tastes, particularly among middle-class customers.[8] Others have emphasized the role played by everyday practice and ingenuity among skilled craftsmen and workers, which did not necessarily follow elite designs and ingenuity.[9] Moreover, it is inadequate to assume there was a 'British model' of industrialization, which proved to be the most successful. As recent research has shown, there was more than one path to industrial society, the course of which varied between countries and regions, and in the day-to-day experiences of people living in the past.[10] Rather than privileging the experience of Britain, and using it as a yardstick against which all other experiences are measured, the nature and extent of industrialization has been shown to vary hugely across time and space. For many historians, industrial 'revolutions' is a more accurate and acceptable way of explaining the multiple pathways to modernity.[11] In critiquing conventional accounts of the Industrial Revolution notions of societal transition, economic progress and scientific and technological advance have given way to a realization of the faltering nature of historical 'progress' and perhaps also modernity itself. As O'Brien notes, in Britain the eighteenth century saw one of the "slowest, and for the working classes, more miserable transitions to an industrial economy in world history."[12] We shall see that Jennings' selection of texts undercuts the triumphalist master narratives of national supremacy, in which coal figures as the driver of Empire-building, and of progress and modernity, by periodically revealing the human cost of the transformation of society in the nineteenth century, and unplanned consequences including new forms of economic and social inequality, which led in turn to new forms of resistance to exploitation.

But there is a further, more pressing challenge to our traditional interpretation of the British Industrial Revolution, which in turn has obvious implications for how we conceptualise change now and in the future. Since the 1980s a new, environmental framing of the story of coal mining and the Industrial

Revolution has emerged, in which coal features as a dirty and dangerous pollutant. In Boyle's pageant, the environmental consequences of the Industrial Revolution are merely present in the background as a nagging, latent driver of subsequent change. Since the turn of the twenty-first century, however, the notion of the so-called 'Anthropocene,' an era succeeding the Holocene in which human agency has acquired geological force, has come to take a central place not only in environmental debates, but also increasingly in the humanities. Although the stratigraphic designation does not in itself impose such an interpretation, many commentators have drawn the conclusion that entry into the Anthropocene implies humankind as a collective is now responsible for maintaining conditions on the planet which permit life to flourish and civilization to persist.[13] The starting point of the new Anthropocene era is a matter of debate. Whereas stratigraphers generally regard the 'Great Acceleration' of the decades after the Second World War as the time when humans began to leave traces in geological strata on a global scale which will be visible millions of years hence, humanities scholars tend to find backdating the Anthropocene to the Industrial Revolution more fruitful, because so many of today's concerns relating to it can be found anticipated in debates, writings and art since the eighteenth or even the seventeenth century.[14] The realization of anthropogenic climate change has created an unforeseen and urgent challenge for the writers of history.

The Anthropocene challenges all of us, not just historians, to interrogate the narrative framings of the past. While the Anthropocene is of course itself a 'grand narrative' linking past, present and future,[15] in this instance we use the notion to disrupt the 'known' narratives of History. It prompts us to ask what these are doing to limit and constrain our vision of what is possible in the present and future, and what alternative historical perspectives we should adopt to help visualize and articulate the nature of change more adequately, and the past, present and future of energy in particular. We can look to the classic vision of scientific and technological progress as our cue for imagining energy system change. But in an epoch defined as one in which human beings have for the first time become a 'global geophysical force,' we are faced with a problematic. The Anthropocene brings anthropogenic climate change into sharp focus as an unintended long-term consequence of the

Industrial Revolution. It renders visible the inadequacy of an interpretative framework that fails to recognize that the economic progress and technological efficiencies of the nineteenth century were facilitated by seemingly limitless supplies of coal (as those of the twentieth century were by oil). As Jonsson argues, the unintended consequences of the Industrial Revolution challenge deep-seated assumptions about technology, the environment and economic growth.[16] The Anthropocene suggests that fossil fuel consumption – identified as enabling the vital escape from the energy constraints of pre-modern society – has brought only a temporary reprieve from the reality of finite fossil energy. In Jonsson's words "historians can no longer treat the environment as merely a pool of resources at the disposal of Promethean technology."[17]

Montage and radical nostalgia: Jennings' disruption of conventional historiography

As Vaclav Smil, doyen of energy studies, has emphasized, large-scale energy transitions such as decarbonisation involve technical and organizational innovation as well as resource substitution, and are by nature gradual.[18] This gradualness is in fact reflected in Humphrey Jennings' anthology, which emphasizes the heterogeneous nature of historical change. Jennings, who is best remembered for his work as a documentary film-maker during the Second World War, worked on *Pandaemonium* (subtitled "The Coming of the Machine As Seen by Contemporary Observers") from the 1920s until his death in 1950. A selection of the voluminous material which he collected – Jennings initially prepared an edition of the *London Bulletin* devoted to the machine, which included texts on "the Impact of the Machine" (July 1938), and gave a series of talks on Poetry and the Industrial Revolution to the miners of the pit village of Cwmgiedd in the Swansea valley in 1943 as thanks for their hospitality while he made the film, *The Silent Village* – was published posthumously in 1985,[19] and reprinted after the London Olympics. It has so far received little attention from scholars.[20] *Pandaemonium* reaches for an explanation of historical change beyond economic arguments, by inviting a consideration of the human experience, perception and understanding of change. The effect is a musing on the complex, ambivalent and fragmented conditions of modernity.[21]

Jennings' selection and curation of passages from a wide variety of writings works to disrupt linear narratives of economic progress and technological and scientific advance and thus to trouble conventional historiography. *Pandaemonium* is, like the Mass Observation movement which Jennings initiated (with Tom Harrisson and Charles Madge), a rich source of information on the impact of change on people's everyday lives. The Mass Observation project focused on the 'ephemera' of everyday life in the first half of the twentieth century. Jennings and his colleagues sought to reveal the ways in which people internalise, act upon, and alter things in all sorts of different ways through their everyday habits, experiences, and interactions. Drawing inspiration from the montage practice of the Surrealists and Walter Benjamin, who believed that reason stifled creative imagination and that free arrangement of disparate elements could liberate the powers of the unconscious, they brought their 'data' together to create an image composed of the fragmentary moments of everyday life.[22] The meanings derived from the resulting polyphony of experiences were to be left to the reader or viewer. Harrisson, Jennings and Madge purposefully avoided devising an analytical framework to interpret the collected 'data,' preferring instead to allow readers to make their own way though the material, and letting it speak for itself. They were especially interested in understanding the penetration of mass media, its interests and forms of (mis)representation in the realms of the everyday, but also in revealing the inconsistencies and 'gaps' in the way media messages were translated, consumed or ignored.[23] As Highmore points out,[24] the Mass Observation project vacillated between claiming 'the people' lack political agency and advocating a 'grass roots' politics that is treated as peripheral and unimportant by the political establishment. Tied into this is the related question of whether social transformation will be instituted by the establishment or change will be generated through social revolution. We shall see the same ambivalences in *Pandaemonium*.

Pandaemonium was shaped by Jennings' understanding of the Industrial Revolution as a process of technological, economic, social and cultural change driven by a complex entanglement of social and political agendas. The "coming of the machine" was in his eyes inextricably bound up with the "subjugation and exploitation" of the country by the "bourgeoisie." As he writes in a comment

explaining the inclusion of one of the texts,[25] the three tasks which lay before the rising middle class at the beginning of the eighteenth century were "the taking of the land from the people by the Enclosure Acts, the creation of the factory system and the invention of machines and means of power to run them." Hence their financial support of the new scientific (secular, rational) way of seeing things, and the investigations of the forces of nature through observation and experiment which had acquired an institutional basis with the founding of the Royal Society in 1660. Jennings writes of "an alteration in vision already being achieved not merely as the *result* of changing means of production, but *also* making them possible."[26] He describes his work in the Introduction as "neither the political history, nor the mechanical history, nor the social history nor the economic history, but the *imaginative* history" of the Industrial Revolution.[27] Science was not yet divorced from the arts, and instrumental materialism had not yet eclipsed notions of stewardship of the natural world and dedication to the common good. The long, central section of the book consisting of texts written between 1790 and 1850 presents visions of progress alongside instances of its partial realisation and the suffering of those who were disadvantaged by developments. The final section, which embraces texts written between 1850 and 1886, is entitled 'Confusion.' Jennings argues that "the story of Pandaemonium" reached its climax in this period, when reality fell increasingly short of the dream, and hope yielded to disillusionment.[28] But a counter-current of optimism is increasingly present in the closing texts, by William Morris and others, describing politics from below, and conveying a sense of the possibility of change through social revolution.

Jennings' standpoint can be described as one of radical nostalgia. Within modernity nostalgia is generally marginalized as evidence of the failure to adapt and progress, yet paradoxically it disturbs modernity and has the potential to transform modern life.[29] Jennings' overall declensionist perspective on the Industrial Revolution, as an initially admirable project which has been sadly corrupted, was doubtless in part a response to contemporary political developments such as the decline in British world hegemony after the First World War, the economic turmoil of the late 1920s, the Great Depression in the thirties, the rise of fascism, and the Second World War. However, it also speaks to Jennings' concerns about the

diminishment of poetry – by which he understood the imagination, the means of vision without which the present and the future are woefully impoverished. In the closing section he includes a passage written by Charles Darwin lamenting such diminishment: "My mind seems to have become a kind of machine for grinding general laws out of large collections of facts, but why this should have caused the atrophy of that part of the brain alone, on which the higher tastes depend, I cannot conceive. […] The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably to the moral character, by enfeebling the emotional part of our nature."[30]

We may surmise that Jennings intended his framing of modern British history as a misappropriation of vision, energy and aspiration by the forces of materialism and self-interest as a provocation to his readers and listeners. It is, as we have noted, to an extent contradicted by counter-narratives tracing the gradual emergence of political consciousness and organised resistance to exploitation among the workers. Individual texts illustrate a transition from the fruitless destruction of machines and factories by rioting mobs[31] to game-changing mass demonstrations,[32] and George Meredith's titulation of the working people as "the power to come" is cited.[33] Although Jennings' historical pessimism seems at times more calculated to disempower readers than to inspire them, he explicitly invited readers to engage critically with the past, by breaking with conventions such as that of reading texts from beginning to end,[34] and by considering instead the "Images" of history presented[35] as a richly textured, at times unwieldy and perhaps perplexing montage. Without ignoring his pessimism, we will here focus on the concern to understand the drivers, mechanisms, and complex and ambivalent social consequences of Britain's industrialization which makes *Pandaemonium* for us an exercise in raising critical awareness of energy system change and a challenge to twenty-first century readers to imagine alternatives. But before doing so, an explanation of what Jennings meant when he wrote that his panorama of the Industrial Revolution was composed of 'images' is called for, and an account of the formal properties of his source texts, and of the thinking behind his selection and arrangement of them.

The "method of poetry": Images, narratives, and their formal arrangement in *Pandaemonium*

In the introduction to *Pandaemonium*, we learn that Jennings constructed the work consciously as a collage of 'images,' i.e. passages describing "moments, events, clashes, ideas" which possess "revolutionary and symbolic and illuminatory quality," whereby this quality derives as much from the writing as from the matter depicted. "Matter (sense impressions) [is] transformed and reborn by Imagination: turned into an image."[36] Each of these "moments at which the situation of humanity is clear"[37] has its place in the overall account, which can be envisaged as an unrolling film.[38] Charles Madge writes that for Jenkins the image was characterised by a convergence of salient verbal, visual and emotional qualities, and an element in a "larger universe of imagery":

> The image here consists not only of the balloon [he refers to a balloon dropping ballast], the golden cloud of dust particles […] but of the relations between these elements and other elements, all ordered into a larger universe of imagery. The individual image, and the imaginative eye that seizes it, is a point of ordonnance in such a universe. It is not only verbal, or visual, or emotional, although it is all of these. It is not in the elements, but in their coming together at a particular moment that the magical potency lies.[39]

The diversity of the individual texts is striking. While many are extracted from letters and journals by members of the educated middle class, workers are present alongside mill owners (e.g. texts 38 and 79), poets and essayists alongside scientists and engineers, free-thinking radicals alongside Quakers, Methodists and Anglicans, Northerners alongside Londoners, and women alongside men. Although only 22 of the 372 texts, i.e. just over 5%, are written by women, they make a distinctive contribution, characterized as they are by freshness of vision and a generally critical stance towards social inequality.[40] Different genres of text are also represented: the extracts from letters, journals, diaries, autobiographies and biographies which predominate are accompanied by passages from travelogues, histories, journalistic articles, and political speeches. There are even scientific reports, sermons, an

epitaph and a court deposition. Jennings also includes a scattering of fictional narratives. These consist of poems (by Milton, Blake, Wordsworth, and Tennyson), and extracts from novels (by Dickens, Samuel Butler and Hardy) and satirical prose (an anonymous article entitled 'York Street Dragons,' essays by Swift, and Smollett's *Humphrey Clinker*). Further texts such as Alexander Somerville's dramatic dialogue and 'A Life Story Related' (texts 225 and 297) dramatise lifeworld situations and are located somewhere between fiction and non-fiction.

By no means all the texts in *Pandaemonium* are 'stories' or 'narratives' in the technical sense of the word. Narratives, as Marie-Laure Ryan writes, involve the construction of a mental image of a world populated with individuated agents (characters) and objects; this world must undergo not fully predictable changes of state (either accidents or deliberate actions by intelligent agents); and the physical events must be associated with mental goals, plans and emotions. By means of this network of connections, narrative gives events coherence, motivation, closure, and intelligibility: it turns them into a plot.[41] This only holds true for a minority of the texts in *Pandaemonium*. However, most of them afford insight into personal experiences of change. Written from a first person perspective, they convey a sense of authenticity, bringing events to life in vivid descriptions and strikingly formulated reflections and evaluations. In this respect they correspond to transdisciplinary (and transmedial) definitions of 'narrative' which have begun to replace the narrower understanding in studies of literary fiction. H. Porter Abbott, for instance, speaks of narrative as simply "the representation of an event or a series of events".[42]

The texts in *Pandaemonium* are arranged in chronological order, but Jennings' selection includes multiple accounts of activities in a given place or an event, thereby highlighting the complexity, ambivalence and openness to different interpretations of the matter described. He sought to harness the power of the dialectical image by juxtaposing different experiences, perceptions, thoughts and practices. Chance, uncertainty, and the unexpected are all given space in the glimpses of everyday life he curated in *Pandaemonium,* confronting readers with multiple, often contradictory stories of change. Ambiguous and unpredictable 'images' were for Jennings a means by which the power of the imagination might be apprehended. Possibly influenced by the Surrealists, who believed the imagination to be a central agent of history, he

sought, rather than focusing on the actions of elite individuals, to find evidence of the 'collective unconscious' in order to reach an understanding of the totality of the everyday.[43]

Following this method, Jennings drew attention to a number of themes. Commentaries on animals and children, enclosure, and London, for instance, appear at intervals throughout the book.[44] The passages on these themes may be separated by a hundred years or more, causing the reader to reflect upon the extent and meaning of change over time. Jennings' alternative way of representing history sought to do justice to the heterogeneous nature of experience. Individual items were often chosen because they have a representative character, going beyond both the individual and the historical moment to reveal a clash or conflict with special clarity. (Jennings alludes specifically to class conflicts, the clash between animism and materialism, the alienation of the expropriated individual, conflicts of ideas, and conflicts of religious, political and moral systems.[45]) This presentation of the material is described as "the method of poetry":[46] unlike the disentangling procedure of discursive analysis, the individual texts address different issues simultaneously, foregrounding their complexity and their interactions.

The 'stories' in *Pandaemonium* do not merely register historical events, they also convey insight into their epistemological and emotional impact. Jennings writes of them as records of "mental events" and "events of the heart",[47] reflecting the fact that his project was informed by a wish to bridge the gulf between mind and feeling, and restore animism to modernity.[48] Structuring metaphors and allusions to mythical, historical or literary figures and events serve to map thought patterns and value sets onto the observed changes. Jennings' consciousness of this is evident in the attention he draws to the framing of accounts through catchphrases, metaphors and cultural allusions, both by reproducing these in the titles he gave to the texts, and also by commenting sporadically on metaphors and images linking the texts.[49] Examples related to energy include the heavens/ clouds/ smoke/ smog, the railway, factory chimneys, coal mining as a liberation of the "sun-force" imprisoned for millennia "at the bottom of the earth",[50] and the machine, to which men are becoming so beholden that they may one day be a mere "parasite" upon them (in the words of Samuel Butler: an "affectionate machine-tickling aphid"[51]). All this

means *Pandaemonium* is of relevance today as an invitation to think imaginatively about the past, present and future of energy as a force shaping people's relationships and experiences of the physical environment, and a rewarding subject for a case study of the contribution of literary as well as historical analysis to energy humanities.

Manifestations of energy and energy system change

Jennings invited the reader[52] either to read the book straight through from the beginning, "as a continuous narrative or *film* on the Industrial Revolution," or to study individual passages or groups of them in detail, or indeed to look up a subject in the Index and follow the references to it. 'Energy' does not appear in the Index. Nor, for that matter, do 'Power,' 'Coal,' 'Fuel' 'Pollution' or 'Waste.' For Jennings, as for us today, the need to produce energy is so deeply necessary and entangled in the reproduction of everyday life that its centrality has become almost invisible. The key passages relating to energy are in fact found under 'Coalminers,' 'Factories,' 'London,' or 'Manchester.' Similarly, 'Energy' is not one of the 16 'Theme Sequences' identified at the end of the book. But it is present in texts listed under the headings 'Industrial Man,' 'Daemons at Work,' 'Miners,' 'Man – Animal – Machine,' 'Light,' and 'The Railway,' while pollution features especially in the texts about 'London,' but is also multiply referenced in texts describing the industrialising regions of the north, Lancashire and Manchester.

Among the principal passages explicitly discussing energy are depictions of coal mining, smelting, steam engines, and the reduction of human beings to automatons in the factory system. It also appears in the descriptions of applied practice and making in workshops ('The Birth of the Cylinder'[53]), and in the form of electricity, a phenomenon which exercised a particular fascination, seeming to constitute a physical manifestation of both the life force and human will. (For the latter, see Alexander Somerville's vision of the future deployment of "moral electricity" in the cause of the universal brotherhood of man.[54]) *Pandaemonium* includes many texts expressing Promethean sentiments.[55] These contain visions of the 'perfect' machine, admiration for engineers ("the god-like inventors and makers of machinery"), delight in the technical triumphs of artificial lighting and flight in hot

air balloons, and awe at the 'sublime'[56] scale of energy generation and its use in manufacturing.

Text 64 is an emblematic passage, inasmuch as it reveals the direct link between the physical power deriving from energy generation and political power, and prompt reflection on the problems which these may give rise to. James Boswell (biographer of Samuel Johnson) writes of a visit to the Birmingham works of Matthew Boulton and James Watt in 1776. Boulton and Watt employed seven hundred men building the improved steam engines with which manufacturing entered a new historical age. Boswell comments that "the vastness and the contrivance of some of the machinery" would have matched Johnson's mighty mind, and records Boulton's proud claim: "I sell here, Sir, what all the world desires to have: POWER!"[57] This was of course as much about the power he exercised over the labour needed to make it happen: Boswell calls Boulton an "iron chieftain" and "father of his tribe," and references inherited manorialism: "One of them came to him, complaining grievously of his landlord for having distrained his goods. 'Your landlord is in the right, Smith' [said Bo[u]lton]."[58] There is an interesting link here with the extracts from the writing of John Wesley, whose conception of the social and moral improvement of the working 'class' through a culture of industriousness and acceptance of one's place in society is explicitly censured by Jennings.[59]

Ample space is in fact devoted to the dark side of the Industrial Revolution, political and otherwise. The book contains sharply critical comments on the impact of inventions and organizational changes related to energy on public health, workers' safety, and social justice. The first mention of coal is found in an extract entitled 'That Hellish and Dismall Cloud,[60] taken from John Evelyn's landmark study of atmospheric pollution, *Fumifugium* (1661): the passage comments on the "fuliginous and filthy vapour" of the sulphurous 'sea-coal' from Newcastle which was already burned in increasing quantities for heating in London in the seventeenth century, stressing its unhealthy as well as its unaesthetic qualities. Moving accounts of mining and industrial accidents include 'The Felling Colliery Disaster'.[61] The account from the *Mechanics' Magazine* of the fatal accident at the opening of the Liverpool to Manchester railway in 1830 neatly symbolises the ambivalence of Britain's industrialization, in which general success ("considerations of the almost

boundless advantages of the stupendous power about to be put in operation"/ "this great monument of human labour"[62]) was achieved at the cost of individual setbacks and personal tragedy. Jennings shows how seventeenth, eighteenth and nineteenth-century heating and energy production from coal and the steam engine offered opportunities to get rich while avoiding responsibility for pollution, and for inconveniencing, displacing and endangering the lives of others. In particular, he illustrates its facilitation of the mass exploitation of labour in the factory system. He writes of the organisation of human labour "on a ruthlessly rational basis":[63] a series of texts reveal the misery of work in silk and cotton mills, including the ubiquitous child labour (e.g. 'The Derby Silk-Mill').[64] In the final section of this essay we look more closely at some of these passages on energy, and examine the part played by cultural templates, rhetorical mechanisms and individual images in framing energy in them, to see if they continue to influence today's debates on energy.

Troubling dualisms and teleologies: Jennings' collage of cultural references and templates

While the new coal-driven economy is proudly framed in many of the narratives of *Pandaemonium* in terms of progress, human achievement, and national greatness, Jennings includes a range of diverging emotional responses and dissenting voices. William Stanley Jevons' ominous prediction of the end of the Britain's industrial prosperity in *The Coal Question: An Enquiry Concerning the Progress of the Nation, and the Probable Exhaustion of Our Coal Mines* (1865), which tapped into a vein of Victorian anxiety over resource depletion and the morality of consuming a fossil fuel which seemed to be polarizing society and undermining national cohesion, is not cited. But it is obliquely referenced, where Matthew Arnold alludes to "late discussions as to the possible failure of our supplies of coal," and argues that England's greatness is not constituted by coal or iron, but by spiritual effort and a culture "worthy to excite love, interest, and admiration."[65] Concern over the loss of pastoral landscapes, the unravelling of traditional social structures and the moral degeneration caused by industrial development and urbanisation compounded misgivings about human control over nature as a usurpation of a divine prerogative (for instance in a passage alluding to the opposition of Anti-Burgher ministers in

Scotland to the introduction of mechanical "fanners" to winnow corn rather than waiting with patience for wind, seeing in it a "distrusting of Providence"[66]).

Cornucopian plenty and Promethean endeavor are not in fact the predominant framings of coal-sourced energy in *Pandaemonium*: burning coal is rather presented as a deeply ambivalent, morally dubious activity. It is as if humankind is on the verge of losing control: the sources of energy, the machines being driven by coal and human labour, are depicted as an unrelenting and unstoppable force of change. The opening passage in the book is an extract from Milton's *Paradise Lost* describing the work of the fallen angels in hell. They are mining, smelting, forging and moulding metals, from which Pandaemonium, the palace of all the devils, is built. Lucifer, master engineer and architect, leads them in pursuit of "Mammon," by "rifling the bowels of Mother Earth for treasures better hid." Far from being the realm of uproar and chaos which we now associate with the word, Milton's Pandaemonium is a site of supreme order and rationality. The story of the construction of this magnificent temple-like "Fabrick" (the word meant 'factory' as well as the cloth produced there) with its ingenious artificial lighting is in the words of Jennings "the real history of Britain for the last three hundred years." "It will never be finished," he comments, urging readers that "it has to be transformed into Jerusalem."[67] Milton's conception of coal-fired energy generation and use as a vast, heroic project, verging on the sublime, but inherently "Satanic," is echoed in the "dark Satanic Mills" of Blake's 'Jerusalem'[68] and a series of later passages. It is motivated alternatively by the "hellish" fires, heat and smoke associated with heavy industry, by the unnatural 'life' of machines (a mobile steam engine encountered by an astonished clergyman on a country road is taken for the devil incarnate in Text 74, and the railway is described as "devilish"[69]), and by the sinister reduction of workers to slaves through the imposition of a mechanical work rhythm.

However, the perception of coal mining as ungodly can also serve less benign purposes, for instance where it resonates in a letter by the Methodist preacher, John Wesley (older brother of the hymn writer Charles Wesley, and co-founder of Methodism) concerning the colliers of Kingswood on the outskirts of Bristol. At the time, the Kingswood coalmines were the main source of fuel for the metalworks,

glassworks, potteries, distilleries and sugar refineries in the city of Bristol. The colliers, who formed an isolated community with a strong collective identity deriving from their dangerous occupation, shared customs and rights, were fiercely independent. They challenged the authorities in the 1720s and 1730s in a protracted struggle against the city's attempts to control coal prices and impose tolls. For Wesley, they constituted a threat to the moral as well as the political order: he describes them as "heathens," "neither fearing God nor regarding man," seemingly "but one remove from the beasts that perish."[70] Writing in 1739, Wesley evokes the reforming zeal of earlier generations of puritan reformers stretching back to the late sixteenth century. However, his diatribe against the supposedly idle, ignorant and ungodly speaks directly to a long history of religious propaganda and attack on the rituals and customs of the uneducated and irreligious. In one of Jennings' rare comments on the texts he presents, he is as critical of churchmen like Wesley, who he sees as exploiting the people's emotional needs[71] as he is elsewhere of the landlords and mill owners who exploited their material needs by harnessing science and invention for commercial ends.

In Jennings' eyes, Wesley was complicit in splitting the mysterious, symbolic (and local) world of custom, ritual and myth from the rational and mechanistic world of modernity. The inclusion of a deposition to the local assizes in Hampshire in 1791 which marks the end of the rural custom of gleaning[72] illustrates the importance Jennings attached to the traditional egalitarian rights which were being swept aside in the new economy and social order. This deployment of the pre-modern past suggests historical nostalgic feeling for a time when knowledge was embedded in the everyday sensory experience of the world (vividly shown in 'Blind John Metcalf'[73]). However, Jennings does not simply follow the historical teleology that the golden age of imagination and 'poetry' had been eroded and devastated by modernity. Rather *Pandaemonium* seeks to reveal the imagination in the makings of modernity, and to inspire belief in our ability to re-imagine the future. This insistence upon the capacity of the 'means of vision' to counter the predominance of the 'means of production' is at the heart of Jennings' project.

As well as bringing into play different notions of the morality of mining and industrial production, and different experiences of the advent of modernity, the

volume also works to trouble historical narratives that present the past in terms of dualisms. Instead Jennings presents a complex web of ideas, knowledge, understandings of the physical environment and the influence of human activities in modifying it. Of course the binary positioning of capitalist mine owner and social reformer is played out, but often their attitudes are less easy to categorise and reveal ambivalences and contradictions.

As we have noted, the people Jennings presents rarely spoke of energy per se, but they often referred to the tangible evidence of the impact of energy system change in the world around them. In *Fumifugium*, Evelyn described the smell of the city – important for health because bad air (miasma) was believed to be the main cause of disease well into the nineteenth century – and the corrosive properties of sulphur, which was released into the atmosphere when burning coal. London was blanketed in a "sooty Crust or Fur […] spoyling the moveables, tarnishing the Plate, Gildings and Furniture, and corroding the very Iron-bars and hardest Stones with those piercing and acrimonious Spirits which accompany its Sulphure".[74] In the seventeenth century coal had become a distinctive and constituent element of everyday life in the city. Evelyn blamed industry, not "culinary fires," for infecting the air with pernicious smoke. In the street and in the home, the inhabitants "breathe nothing but an impure and thick Mist, accompanied by a fuliginous and filthy vapour, which renders them obnoxious to a thousand inconveniences, corrupting the *Lungs*, and disordering the entire habit of their Bodies".[75] By including this extract, Jennings suggests a much longer history of reliance on fossil fuels than that indicated by popular narratives of the Industrial Revolution. Today, Evelyn's treatise might be read as a provocation, a realisation of the deep history of the social and environmental consequences of fossil fuel consumption in Britain.

But Jennings' work does more than this. In attending to the multiplicity of experience and imagination, by curating this extensive, diverse, and often seemingly idiosyncratic selection of first-hand accounts (N.B. the published volume is a selection by Charles Madge and Marie-Louise Jennings, constituting a mere third of the material which her father collected[76]), *Pandaemonium* works to trouble straightforward, linear orderings of time. Jennings invited readers to make connections between the extracts he arranged in individual chapters, and through

the book as a whole, leaving them to create their own stories of historical change. He encouraged readers to make comparisons that he might not have made himself, including ones relating to energy and pollution. Jennings includes, for instance, an extract from Sir Richard Phillips' account of his experiences of walking in London in c.1815. Written well over a century after Evelyn published *Fumifugium*, Phillips draws attention to the visible destruction and blight caused by "nearly a million coal fires." The passage draws us to his observations of the physicality of place, the air he breathed, and the very surfaces of the pavements and pathways upon which he walked: "Other phenomena are produced by its union with fogs, rendering them nearly opaque, and shutting out the light of the sun; it blackens the mud of the streets by its deposit of tar, while the unctuous mixture renders the foot-pavement slippery; and it produces a solemn gloom whenever a sudden change of wind returns over the town the volume that was previously on its passage into the country."[77] 'The Plague-Wind,' an extract from John Ruskin's *Fors Clavigera* whose keyword and title references miasmatic theory, continues the theme into the late nineteenth century. Ruskin describes the grim, if not terrifying change whereby the bright spring and summer mornings of his childhood have been replaced by a dismal grey cloud "which no ray of sunshine can pierce," and a "strange, bitter, blighting wind": "It looks partly as it were made of poisonous smoke; very possibly it may: there are at least two hundred furnace chimnies in a square of two miles on every side of me. But mere smoke would not blow to and fro in that wild way. It looks to me as if it were made of dead men's souls."[78]

Here and elsewhere, Jennings' choice of texts for inclusion is guided by a wish to capture the authentic experience of being in the moment, seeing, smelling, hearing and sensing. (Editorial commentary is minimal: he only occasionally remarks on similarities and differences between the passages.) Change emerges as a constant presence through the volume. For the individuals writing and remembering, it was happening as it had never happened before. Yet familiar scenes recur that cannot be easily differentiated by time. This blending of time and place foregrounds historical change as contingent, often contradictory and non-linear. The authors offer up their digested experiences, drawing on visual references, memories and re-imagined moments, which express novelty, joy, bewilderment and alarm, as sets of composite

emotions. A commonality of experience is reached through the ways in which the writers and interviewees communicate their experiences by drawing on a recognised language of familiar terms, expressions, metaphors, and inferences. The past then is a continual presence informing the ways people found the means to express their being in the world and the profound sense of change they clearly felt. This is no doubt similarly true of popular perceptions of the transition to renewable energy and their articulation today.

The forms of cultural framing through which change was perceived include further religious narratives such as expulsion from Eden, the tower of Babel, and the apocalypse, and motifs from fairy tales and folk belief. Sheffield is described as "this great city of Vulcan",[79] London as "this enormous Babel of a place,"[80] and a nocturnal railway journey as "likest thing to a Faust's flight on the devil's mantle."[81] The York Buildings Waterworks Company's installation of a Newcomen steam engine in London to pump water from the Thames for domestic supply is the subject of a satirical pamphlet published in 1725,[82] which uses the imagery of dragons and magicians to suggest something monstrous was being done in the city, which would wreak havoc and terror. While consciously exaggerating superstitious popular objection to this machine, the author correctly anticipated both the immense quantities of coal needed to fuel the engine, and the atmospheric pollution it caused, factors which were to lead to its decommissioning six years later. 'The York Buildings Dragons' reflects the mixture of public amazement, anxiety and justified scepticism in the face of the early steam engine.

Animation and personification of the steam engine are common ways of conveying the unnerving impression it made on contemporaries. In her account of the "poverty and wretchedness" observed in a Scottish mining village, Dorothy Wordsworth notes of a giant mining engine: "it was impossible not to invest the machine with some faculty of intellect; it seemed to have made the first step from brute matter to life and purpose, showing its progress by great power",[83] and Jennings reproduces Dickens's famous description of the 'nodding donkeys' of the Lancashire cotton mills in *Hard Times* as "elephant[s] in a state of melancholy madness",[84] powerfully fusing animation of the machine with the resulting regimentation and quasi-imprisonment of the mill workers in a single image. The

mixed feelings of contemporaries are captured in texts alternating between wonder and horror. William Cobbett writes of the "horrible splendour" of Sheffield's iron and steel furnaces,[85] and Fanny Kemble expresses "amazement and delight" at the "subterranean vastness" of Brunel's Thames Tunnel, but equally shock at the appearance of the workmen, "all begrimed, with their brawny arms and legs bare, some standing in black water up to their knees, others laboriously shovelling the black earth in their cages." She sums up the scene as "the beautiful road to Hades."[86] Such phrases become a commonplace, as do characterisations of the Black Country and other industrial landscapes as 'Pandemonium.'[87]

Light is one of the less predictable themes woven through the book. In the extracts Jennings curated, there is wonder and interest in the coming of electric lighting, but this is tempered with unease and ambivalence in the face of a change which figures human damage to the natural environment and artificial compensation for it as much as triumphant control and improvement of living conditions. We have noted the presence of a number of extracts describing strange weather, and lack of daylight caused by fog and pollution. The experience of a key consequence of energy system change which they reveal is interpreted through the perceived and imaginary changes taking place in the physical environment. In some instances there appears to be a conscious filtering of the perception of change through cultural templates in an effort to play down its negative dimensions and deflect the sense of a need to take remedial action, by aestheticising industrial scenes, be this through reference to Dante's Inferno,[88] introduction of elements of Gothic, or the portrayal of atmospheric pollution, slag heaps and even mining disasters as manifestations of the sublime. The painter Benjamin Haydon for instance describes the smoke of London as a "sublime canopy that shrouds the City of the World," writing: "the sight of it always filled my mind with feelings of energy such as no other spectacle could inspire."[89] Others, however, approached the aestheticizing impact of smog more critically. In 1851 the American novelist Nathaniel Hawthorne described, when walking through London: "everywhere the dingy brick edifices heaving themselves up, and shutting out all but a strip of sullen cloud, that serves London for a sky […] and at this season always a fog scattered along the vista of streets, sometimes so densely as almost to spiritualise the materialism and make the scene resemble the

otherworld of worldly people, gross even in ghostliness."[90] John Ruskin powerfully evoked the diminishing of natural light which had happened within a generation: "You think it a great triumph to make the sun draw brown landscapes [in photographs] […] when you have shut the sun out with smoke, so that he can draw nothing more."[91] Ruskin's lecture, 'The Storm-Cloud of the Nineteenth Century,' today regarded as a seminal piece of environmental writing, emphasised the interrelatedness of the divine, natural, and human economies. It presented external pollution as reflecting an internal pollution at the heart of Victorian society.

Conclusion

We have found in the complexities, ambivalences, inherent contradictions, partial disclosures and overlayering of Jennings' accounts of energy change through conventions of thinking and form a congenial common ground for our exploration of past energy narratives, and we believe that a similar approach to contemporary stories of the transition to renewable energy could be equally fruitful. Such stories as those presented by Jennings can work to fold human experiences from the past into the present and prompt a new imaginary for the future. History's capacity to forge a sense of time, and thereby to contextualise events and processes, enables the discipline to make a valuable, critical contribution in the present. But more might be done to think about how the past is presented in the public sphere, heritage institutions and media by troubling teleological accounts and linear timeframes that pinpoint key events, and moments of transformation, from the perspective of mostly male elites. This needs to be an open ended narrative, one that does not necessarily conform therefore to the usual narrative expectations of history which seek closure. Jennings has been our inspiration in working towards a different kind of story about energy that allows the deep human experience of change to penetrate the surface. *Pandaemonium* invites us to engage with the contingent rather than causal factors of change. It impresses upon us plurality rather than uniformity. Yet it refuses to privilege the individual. The effect of reading the fragmentary moments or 'images' curated by Jennings is to gain a sense of the ways people reach for an expression of the commonality of experience, and they do this by folding a sense of time

(expressed through the language of description for example) and place into their narratives of change.

While the writers, workers, activists, entrepreneurs and observers represented in the volume sensed the changes they were witness to as extraordinary and unprecedented, often mystifying and horrifying in equal measure, we have noted how frequently they sought or were indeed compelled to find expression for them through existing cultural frameworks. In some cases, they allowed their perception to be limited by adopting conventions of thought and familiar diction. But we have also noted cases of creative adaptation which anticipate ways of meeting the challenge of living in the Anthropocene, at a time when we are called on to reimagine our relationship with the planet and be mindful of our responsibility for the future of life on earth. With its emphasis on the material-ecological limits to economic growth and population growth, and its revelation of the dependence of modernity on unsustainable levels of consumption of non-renewable energy, the Anthropocene is forcing us to rethink our way of living. The stories we tell about ourselves have an important part to play in this process of rethinking, with their metaphorical concepts defining and constituting classes of objects and identities, their framings of problems, and their imaginings of possible futures. Jennings' narratives work with a variety of approaches and techniques, including sensitive observation and empathetic interaction, historical and cultural allusion, personification, and satirical exaggeration. Perhaps the most innovative formal feature of *Pandaemonium* is, however, its overall structure. Jennings assembles an inventory of the Industrial Revolution enabling readers to grasp individual phenomena and gauge their relationship with the whole. His juxtaposition of 'images,' whose themes are developed by repetition, accretion and accumulation, corresponds surprisingly closely to the "database aesthetic" and collage form which Ursula Heise advocates as capable of "foster[ing] an understanding of how a wide variety of natural and cultural places and processes are connected and shape each other around the world, and how human impact affects and changes this connectedness," and combining sense of place with sense of planet.[92]

Working together, the humanities disciplines have a critical intervention to make in how we represent, discuss and imagine energy system change today. In

bringing the past into the present and revealing the heterogeneity of everyday experiences, we can perhaps begin to envisage a different way of thinking about energy system change, in which change is recognized as a constant in everyday life.

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[1] Edward Anthony Wrigley, *Energy and the English Industrial Revolution* (Cambridge: Cambridge University Press, 2010).
[2] Danny Boyle (Artistic Director), *London 2012 Olympic Games* (BBC DVD), 2012.
[3] See Frank Cottrell Boyce's Foreword in Humphrey Jennings, *Pandaemonium 1660-1886. The Coming of the Machine As Seen by Contemporary Observers*. Foreword by Frank Cottrell Boyce, ed. Marie-Louise Jennings and Charles Madge (London: Icon, 2012), vii-viii.
[4] Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* 35, no. 2 (Winter 2009): 197-222.
[5] Mark Levene, "Climate Blues: Or How Awareness of the Human End Might Re-instil Ethical Purpose to the Writing of History," *Environmental Humanities* 2 (2013): 153-73.
[6] Vaclav Smil, *Energy Transitions: History, Requirements, Prospects* (Santa Barbara, CA et al.: Praeger, 2010).
[7] Joel Mokyr, *The Enlightened Economy: An Economic History of Britain, 1700-1850* (New Haven, CT: Yale University Press, 2009); Mokyr, "The European Enlightenment and the Origins of Modern Economic Growth," in Jeff Horn, Leonard N. Rosenband and Merritt Roe Smith, eds, *Reconceptualizing the Industrial Revolution* (Cambridge, Mass.: MIT Press, 2010), 65-86.
[8] Maxine Berg, 'The British Product Revolution of the Eighteenth Century,' in Jeff Horn, Leonard N. Rosenband and Merritt Roe Smith, eds, *Reconceptualizing the Industrial Revolution* (Cambridge, Mass.: MIT Press, 2010), 47-64.
[9] Raphael Samuel, "Workshop of the World: Steam Power and Hand Technology in mid-Victorian Britain," *History Workshop Journal* 3 (1977): 6-72.
[10] Horn et al., *Reconceptualizing the Industrial Revolution*, 88; Kenneth Pomeranz, *The Great Divergence: China, Europe and the Making of the World Economy* (Princeton: Princeton University Press, 2000); Pat Hudson, ed., *Regions and industries: A perspective on the Industrial Revolution in Britain* (Cambridge: Cambridge University Press, 1989).
[11] Horn et al., *Reconceptualizing the Industrial Revolution*, 88.
[12] Patrick O'Brien, "Deconstructing the British Industrial Revolution as a Conjuncture and Paradigm for Global Economic History," in Horn et al., eds, *Reconceptualizing the Industrial Revolution*, 34.
[13] See for instance Chakrabarty, "The Climate of History," 214 and 218.
[14] See Evelyn's 'Fumifugium,' in Jennings, *Pandaemonium,* p. 9.
[15] See Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene. The Earth, History and Us*, trans. David Fernbach (London and New York: Verso, 2016), Chapter 1 for a critical interrogation of its inherent assumptions and implications.
[16] Fredrik Albritton Jonsson, "The Industrial Revolution in the Anthropocene," *The Journal of Modern History* 84 (September 2012): 679-96.
[17] Ibid., 681.
[18] Smil, *Energy Transitions*.
[19] See Jennings, *Pandaemonium*, xxv-xxvi.
[20] See, however, Michael Saler, "Whigs and Surrealists: The 'Subtle Links' of Humphrey Jennings' *Pandaemonium*," in George K. Behlmer and Fred M. Leventhal, eds, *Singular Continuities: Tradition, Nostalgia, and Identity in Modern British Culture* (Stanford, CA: Stanford University Press, 2000), 123-42; and Ben Jones and Rebecca Searle, "Humphrey Jennings, the Left and the Experience of Modernity in Mid Twentieth-century Britain," *History Workshop Journal* 75, no. 1 (Spring 2013): 190-212.
[21]Jones and Searle, "Humphrey Jennings."
[22] Ben Highmore, *Everyday Life and Cultural Theory: An introduction* (London: Routledge, 2002); Saler, "Whigs and Surrealists."
[23] Highmore, *Everyday Life*, 85.
[24] Ibid., 105.

[25] Jennings, *Pandaemonium*, 37-8.
[26] Ibid., 38.
[27] Ibid., xiii, our emphasis.
[28] See his extract from the long prose poem, *Towards Democracy*, by the Fabian socialist Edward Carpenter, ibid., 344-5.
[29] Alastair Bonnett, *Left in the Past: Radicalism and the Politics of Nostalgia* (New York and London: Continuum, 2010), 1-11.
[30] Jennings, *Pandaemonium*, 344.
[31] Ibid., 76-7.
[32] See the accounts of the Peterloo Massacre, ibid., 146-52.
[33] Ibid., 332.
[34] Ibid., xix.
[35] Ibid., xiii.
[36] Ibid., xvii.
[37] Ibid., xiii.
[38] Ibid., xix. See also xxvii, where Marie-Louise Jennings writes that her father's composition "can be compared to a film: each piece moves on to the next, telling a story which never stops."
[39] Quoted in Highmore, *Everyday Life*, 92.
[40] See the series of extracts from the autobiography of Mary Anne Schimmelpenninck on the members of the Birmingham Lunar Society (Jennings, *Pandaemonium*, 85-92); the passage from Dorothy Wordsworth's *Recollections of a Tour made in Scotland* describing a visit to a mining village (119-21); and Fanny Kemble's delightful letter recounting her experiences during a day's outing on the Liverpool to Manchester railway in 1830 (172-6).
[41] Marie-Laure Ryan, "On the Theoretical Foundations of Transmedial Narratology," in Jan Christoph Meister, ed., *Narrative beyond Literary Criticism. Mediality, Disciplinarity* (Berlin and New York: de Gruyter, 2005), 1-22; here 4.
[42] H. Porter Abbott, *The Cambridge Introduction to Narrative* (Cambridge: Cambridge University Press, 2002), 12.
[43] Saler, "Whigs and Surrealists," 124.
[44] Jennings, *Pandaemonium*, 23, 72f., 102, 110, 152-5 and 202f.
[45] Ibid., xiv.
[46] Ibid.
[47] Ibid., xiii.
[48] Saler, "Whigs and Surrealists," 126.
[49] For instance, Jennings, *Pandaemonium*, 274, 280, 284.
[50] Ibid., 324-5.
[51] Ibid., 328.
[52] Ibid., xix.
[53] Ibid., 158-9.
[54] Ibid., 236.
[55] For instance, ibid., 7, 61-2, 68-9, 73-4, 121-2, 128, 135, 235.
[56] Ibid., 79.
[57] Ibid., 73.
[58] Ibid.
[59] Ibid., 50.
[60] Ibid., 8-9.
[61] Ibid., 132-4.
[62] Ibid., 176.
[63] Ibid., 12.
[64] Ibid., 47-8.
[65] Ibid., 319.
[66] Ibid., 54.
[67] Ibid., 5.
[68] Ibid., 126.
[69] Ibid., 212.
[70] Ibid., 50.
[71] Ibid., 7.

[72] Ibid., 97.
[73] Ibid., 77-8.
[74] Ibid., 9.
[75] Ibid., 8.
[76] Ibid., xxviii.
[77] Ibid., 136.
[78] Ibid., 326-7.
[79] Ibid., 160.
[80] Ibid., 165.
[81] Ibid., 212.
[82] Ibid., 38-41.
[83] Ibid., 121.
[84] Ibid., 273.
[85] Ibid., 170.
[86] Ibid., 169.
[87] For instance, ibid., 171, 311.
[88] Ibid., 246.
[89] Ibid., 125.
[90] Ibid., 281-2.
[91] Ibid., 325.
[92] Ursula Heise, *Sense of Place and Sense of Planet: The Environmental Imagination of the Global* (Oxford: Oxford University Press, 2008), 21, 67.