THE SMOKE OF LONDON

The Smoke of London uncovers the origins of urban air pollution, two centuries before the industrial revolution. By 1600, London was a fossil-fuelled city, its high-sulfur coal a basic necessity for the poor and a source of cheap energy for its growing manufacturing sector. The resulting smoke was found ugly and dangerous throughout the seventeenth and eighteenth centuries, leading to challenges in court, suppression by the crown, doctors' attempts to understand the nature of good air, increasing suburbanization, and changing representations of urban life in poetry and on the London stage. Neither a celebratory account of proto-environmentalism nor a declensionist narrative of degradation, *The Smoke of London* recovers the seriousness of pre-modern environmental concerns even as it explains their limits and failures. Ultimately, Londoners learned to live with their dirty air, an accommodation that re-frames the modern process of urbanization and industrial pollution, both in Britain and beyond.

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THE SMOKE OF LONDON

Energy and Environment in the Early Modern City

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Conventions

Quotations from primary sources have been modernized in spelling and punctuation. Tons are imperial units of 2240 pounds. Dates are taken to begin on 1 January, except in the case of publications appearing between 1 January and 25 March, which are rendered as: 1643/4. Place of publication is London unless noted otherwise. Dates are old style before 1752. All websites were accessed on 14 July 2015.

Prologue: The Smoke of London

Among the innumerable people who arrived in eighteenth-century London, for work or pleasure, as tourists or immigrants, were two men from different corners of the British Empire. They were both born early in the century during the reign of Queen Anne, and both enjoyed long and distinguished careers before their deaths many decades later. They were nearly contemporaries, both raised in the world of printing and bookselling, both coming to the capital as young men, both achieving fame through their pens and conversation. They differed strongly from each other in politics and religion, so that while they moved in similar circles they were not friends. Their only known meeting occurred, inevitably, in London, the capital of England and of the increasingly global British Empire. It was a city that played a central role in both of their careers, and yet when they described London in writing neither tried to pretend that it was a healthy, clean, or beautiful place.

On the contrary, for both men one of the capital's defining characteristics was its dirty, smoky air. The elder man, raised in the colonies, once contrasted life in the capital with the 'sweet air' of a friend's country home in Hampshire. 'I now breathe with reluctance the smoke of London,' he wrote upon returning from 'the agreeable retirement' of the country to the city's busyness and dirt. Urban smoke, he wrote elsewhere, was 'sulphury' and rendered 'thick-built towns and cities … half suffocated', a problem that he aimed to fix through new fireplace designs. The younger man, raised in the Midlands, also thought urban living was an inherently smoky experience. One of his many essays pronounced that both brilliant talk and urban beauty were similarly rare:

> A transition from an author's books to his conversation, is too often like an entrance into a large city, after a distant prospect. Remotely, we see nothing but spires and temples, and turrets of palaces, and imagine it the residence of splendor, grandeur, and magnificence; but, when we have passed the gates, we find it perplexed with

narrow passages, disgraced with despicable cottages, embarrassed with obstructions, and clouded with smoke.

This author only knew one 'large city', but he knew it well. It was a place so vibrant that he famously declared that 'a man that is tired of London is tired of life, for there is in London all that life can afford'. But it was a smoky life, and was not for everyone. Our author's own beloved wife, we are told, lived in airy Hampstead, four miles north of the City, 'while her husband was drudging in the smoke of London'. Moreover the recorder of this observation, the author's Scottish companion and biographer, himself worried about a wife whose health 'renders her quite unfit to live in the smoke of London'.[1]

For authors like Benjamin Franklin, Samuel Johnson, and James Boswell, 'the smoke of London' was a useful phrase because it assimilated the city's manifold possibilities into its physical environment. For these men the foggy haze that rarely lifted from London during the best weather, and which made it quite dark for much of the winter, was a defining feature of metropolitan life, something that set London apart. As a city London was neither uniquely big nor uniquely rich nor especially grand; Paris was comparably large and boasted better monumental architecture, Amsterdam was the centre of a similarly bustling commercial network, and Madrid and Istanbul were also capitals of great empires. But London's urban environment was seen to be clearly distinct, a fact which was tolerable for Johnson and Franklin, but which for some foreign travellers was unambiguously a bad thing.

For them, London was defaced. Its buildings, wrote one German visitor, were 'blackened with the unmerciful smoke of coal-fires'. Coal smoke, for him, was 'that bane of London'. Another German found the House of Lords 'tarnished with smoke', Westminster Abbey's coronation chairs 'wretched and smoke-blackened', and items in the Royal Society's museum 'ruined by dust and smoke, so that they look utterly black and wretched'.[2] When the Finnish-Swedish naturalist Pehr Kalm stayed in London in 1748 – a few

[1] Benjamin Franklin to Jonathan Shipley, 24 June 1771; *An Account of the New Invented Pennsylvanian Fire-Places* (Philadelphia, 1744), both accessed at www.franklinpapers.org. Samuel Johnson, *The Rambler* Issue 14, 5 May 1750 in *The Yale Edition of the Works of Samuel Johnson* (New Haven, 1968), III, 79–80; George Birkbeck Hill, ed., *Boswell's Life of Johnson* (Oxford, 1887), I, 275; III, 187; Boswell to William Johnson Temple, 20 July 1784, Nellie Pottle Hankins and John Strawhorn, eds., *The Correspondence of James Boswell with James Bruce and Andrew Gibb, Overseers of the Auchinleck Estate* (New Haven, 1998), 97. For Franklin and Johnson attending a meeting together in 1761, 'Franklin, Benjamin' in *The Samuel Johnson Encyclopedia*, Pat Rogers, ed. (Westport CT, 1996), 150–1; for their antagonistic political engagement, Neill R. Yoy, 'Politics and Culture: The Dr. Franklin – Dr. Johnson Connection, with an Analogue', *Prospects* 23 (1998), 59–105.

[2] Karl Ludwig and Freiherr von Pöllnitz, *The Memoirs of Charles-Lewis, Baron de Pollnitz* (1739), II, 431, 433; W. H. Quarrell and Margaret Mare, trans. and eds., *London in 1710 From the Travels of Zacharias Conrad von Uffenbach* (1934), 74, 92, 101.

months before visiting Franklin in Pennsylvania – he could neither see St Paul's dome from Greenwich nor the rest of the City from atop St Paul's. Both were obscured by 'the thick coal smoke, which on all sides hung over the town'. Kalm complained:

> However free I was from cough when I now and again went into London from the country, I got one always as soon as I had been there a day … but as soon as I left London and had been two days out in the country I lost my cough. All who lived far out in the country, and were not accustomed to coal smoke, even native Englishmen, had the same tale.[3]

For Kalm, coal smoke made London into a place that was difficult either to admire or to enjoy.

Another European acquaintance of Franklin's, the *philosophe* Jean-Pierre Grosley, was even more appalled by London's atmosphere. 'This smoke', he wrote in 1765, 'rolling in a thick, heavy atmosphere, forms a cloud, which envelops London like a mantle; a cloud which the sun pervades but rarely; a cloud which, recoiling back upon itself, suffers the sun to break out only now and then'. It stifled inhabitants, Grosley claimed, covered citizens with sooty rain, and blackened buildings both inside and out. And it was getting worse: 'if the increase of London proceeds as far as it may, the inhabitants must at last bid adieu to all hopes of ever seeing the sun'.[4] A less self-consciously enlightened but no less observant visitor, Atajuk from Labrador, found London in 1772 to be 'too many houses, too much smoke, too many people'.[5]

Such impressions struck visitors especially forcefully, unused as they were to any city with a pervasive smoke cloud, but the English themselves also described London as a city – even as *the* city – of smoke. In 1748, a few weeks after Kalm developed his cough, the blue-stocking (and friend of Johnson) Elizabeth Carter wrote to a friend that a summer in Enfield, 10 miles north of London, offered 'a more eligible situation than the noise and dust and smoke of a crowded city'. By the end of the summer, however, plans had changed: 'I am not so happy as to be running wild in the nettle groves of Enfield, but am panting for breath in the smoke of London'.[6] For Carter,

[3] Pehr Kalm, *Kalm's Account of His Visit to England on His Way to America in 1748*, Joseph Lucas, trans. (1892), 42, 138.

[4] Pierre-Jean Grosley, trans. Thomas Nugent, *A Tour to London: or, New Observations on England, and Its Inhabitants* (1772), 44.

[5] George Cartwright, *A Journal of Transactions and Events, During a Residence of Nearly Sixteen Years on the Coast of Labrador* (1792), I, 269; discussed by Coll Thrush, 'The Iceberg and the Cathedral: Encounter, Entanglement, and Isuma in Inuit London', *Journal of British Studies* 53:1 (2014), 59–79.

[6] Elizabeth Carter to Susanna Highmore, 8 June 1748, in Gwen Hampshire, ed., *Elizabeth Carter, 1717–1806: An Edition of Some Unpublished Letters* (Cranbury, NJ, 2005); Carter to Catherine Talbot, 5 August 1748, in *A Series of Letters between Mrs. Elizabeth Carter and Miss Catherine Talbot from the Year 1741 to 1770* … Vol. I (1808), 287.

and for her fellow intellectuals like Johnson, Boswell, Franklin, Kalm, and Grosley, much of what made London special was expressed by its material environment; this centre of human commerce and industry sat beneath a visible atmosphere of its own creation. John Evelyn's famous denunciation of urban smoke in 1661's *Fumifugium* is therefore not the isolated voice in the wilderness it is sometimes taken to be. Many claims that Evelyn developed in detail were also voiced, sometimes very earnestly, sometimes in jest, by innumerable other Londoners who could not help but notice that their city's environment had changed.

The process by which smoky air came to be a fundamental part of the image and experience of urban life in London is the subject of this book. No other city in the world contended with a similar atmosphere during the early modern period because, quite simply, no other city burned nearly as much dirty coal as London. This coal was a mineral fuel, a sedimentary rock found in the region surrounding Newcastle in north-eastern England. It was bituminous, a middle-grade coal high in energy but one whose combustion released smoke that was thick, dark, and contained concentrations of pollutants not emitted by wood fuels. Because of the concurrence of London's especially large size, its unequalled consumption of energy, and the particularly dirty nature of this fuel, England's capital achieved a dynamic unique in the early modern world but familiar thereafter: urban expansion, economic growth, and rising energy consumption contributed to each other in a series of positive feedback loops, collectively leading to environmental degradation. For a modern economist, such dirtiness is a negative externality or disamenity. During the seventeenth and eighteenth centuries, as this cluster was confronted for the first time, observers sometimes called it 'nuisance', 'noisome', 'pollution', or simply 'the smoke of London'.

Pollution has a history, and there are many ways to tell it. Environmental historians, or indeed others interested in humanity's changing relationship with its natural or built environments, have usually fit pollution's past into one of three grand narratives. For some, humans have always been wrecking their environment, and continuities and parallels are therefore as important as change over time. Others stress that before the twin arrivals of modern medical science and modern material wealth almost everybody in the past was poor and dirty but no one minded very much. A third story asserts the novelty of pollution, pointing out that problems like smoky air did not exist in significant ways before 1800, when industry transformed humanity's capacity to extract natural resources and change natural environments.

Different as they are, there is something to be said for all of these positions. Humanity has indeed been changing its natural environment for a very long time: land-clearance, burning, and hunting are far older than human civilization, and ancient cities from Rome to Xian consumed resources and

created waste on large scales.[7] It is also true that pre-modern people probably did tolerate more dirt than their richer descendants, blessed as we are with abundant water, chemical cleaning agents, and biomedical information.[8] Finally, modern economic growth raised levels of pollution to unprecedented levels all over the world. The smoky and smoggy air threatening public health in cities like Beijing, Delhi, Cairo, and Mexico City is among the results of this growth, as are a host of other pollutants, from nuclear radiation to mercury to hormone disruptors. These threats to the global environment and public health have no pre-modern equivalents; this is indeed something new under the sun.[9]

Each of these grand narratives reveal important truths, therefore, but each is also insufficient because none of them can explain change on the scale that happened in Europe during the centuries from 1500 to 1800. If we stress that environmental degradation is always with us, we miss crucial distinctions and risk lumping together very different types of environmental intervention and stress, as if river salinization in ancient Mesopotamia were equivalent to the Three Gorges Dam. To define the period before industrialization primarily through its lack of modernity – whether we interpret this as a curse, since most were then poor and dirty, or as a blessing, since none yet suffered a toxic planet – would be to erase distinctions within the pre-modern, pre-industrial world. The centuries before 1800 witnessed too much change, especially in England, for this approach to be reasonable. Just as the world of William Shakespeare and Francis Drake was not the world of Jane Austen and James Watt, so London's urban environment was profoundly different in 1800 from what it had been in the sixteenth century. The dramatic changes that occurred during these early modern centuries have little place either in the grand narrative of continuity or in the Manichean dichotomy which divides history into the pre-modern and the modern. Both approaches deny the possibility of saying much of anything about the early modern period. This book, however, suggests that the history of the environmental changes experienced during these centuries is worth telling.

This history should be told not only as an act of recovery – written about, as historians often say, 'on its own terms' – but also because the story of this particular piece of the pre-modern, pre-industrial world is indispensible if we want to understand the enormous changes that came later. Eighteenth-century England was powered by fossil fuels, a fact that was

[7] J. Donald Hughes, *An Environmental History of the World: Humankind's Changing Role in the Community of Life* (Abingdon, 2009), ch. 2–4.
[8] But see Mark Jenner's critiques of this narrative in 'Follow Your Nose? Smell, Smelling, and their Histories', *American Historical Review* 116 (2011), 335–51.
[9] J. R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York, 2001).

particularly true and particularly noticeable in London. It therefore prefigured in many important respects our modern world. It has been argued that the 'fossil fuel revolution' was an epochal pivot in human affairs, comparable only to the agricultural revolution. If, as Edmund Burke III has suggested, we might divide *all* of history into two just phases, the age of solar energy and the age of fossil fuels, then the moment of transition from the former to the latter takes a central place within the story of humanity and the world it occupies.[10]

From this perspective, the experience of London from its transition to coal in the years before 1600 until the beginnings of industrialization around 1800 is not like other pre-modern experiences. There was indeed dirty air in ancient Rome and deforestation in the Mayan Empire, but it was only in early modern England that environmental challenges were solved in a way that led ultimately to a new global energy regime. If we take seriously Burke's suggestion that energy might define historical periods, then we need to understand how and why the people of England converted to a coal-fired society during the centuries between 1600 and 1800. British historians were once confident that there was something special about these years, the gestational period – so it has often been argued – of the modern state or parliamentary sovereignty or the British Empire or social classes or capitalism. All of these grand narratives have been challenged, but it may perhaps be defensible to suggest that from the perspective of energy regimes and their relationship to environmental pollution, early modern England was, or became, 'the first modern society'.

The Smoke of London describes this transformation as a social and cultural, as well as an economic and environmental, development. It argues that London's conversion to coal as its primary fuel led to two inter-connected processes. First, coal produced smoke that Londoners often found ugly, unhealthy, or undesirable, and this book therefore recovers the unappreciated and largely unknown early modern concern for urban air pollution. Second, despite this concern Londoners' coal consumption expanded throughout this period and beyond because it became deeply embedded in conceptions of social stability, economic prosperity, and state power. The rise of the coal-fuelled economy was therefore, and was seen at the time to be, also the rise of the smoky urban atmosphere, as ultimately early modern Londoners decided that coal brought benefits that rendered its dirtiness acceptable. What follows is therefore an environmental history told through the experiences, ideas, conflicts, and goals of city-dwellers and their governors. It

[10] Edmund Burke III, 'The Big Story: Human History, Energy Regimes, the Environment,' in Edmund Burke III and Kenneth Pomeranz, eds. *The Environment and World History* (Berkeley, 2009), 33–53.

describes the ways that an increasingly urban and increasingly capitalist society confronted the consequences of its new energy regime, the ways that concern for air pollution led not to environmentalism but to accommodation. Many found London's smoke to be appalling, many others thought it was acceptable, and others, like the agriculturist Arthur Young, were content to embrace paradox and find it to be both at the same time. Towards the end of the eighteenth century he wrote that 'the clouds of coal smoke that envelop London' tainted the air year-round, and he launched into rapture upon escaping into the country's 'freshness and sweetness of air, the quiet and stillness, the sunshine unclouded by smoke'. And yet he could also exclaim 'thank God for the coal fires of England'.[11] Young spoke for many who found coal fires to be both blessing and curse. The smoke of London, then, was a space of multiple meanings, a symbol of a new kind of urban life with all of its grandeur and grime.

[11] Arthur Young, *Travels During the Years 1787, 1788, and 1789* (Dublin, 1793), I, 128, 503; Matilda Betham-Edwards, ed., *The Autobiography of Arthur Young, With Selections from His Correspondence* (Cambridge, 2012), 352.