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## **The Smoke of London: Energy and Environment in the Early Modern City (William M. Cavert, 2016)**

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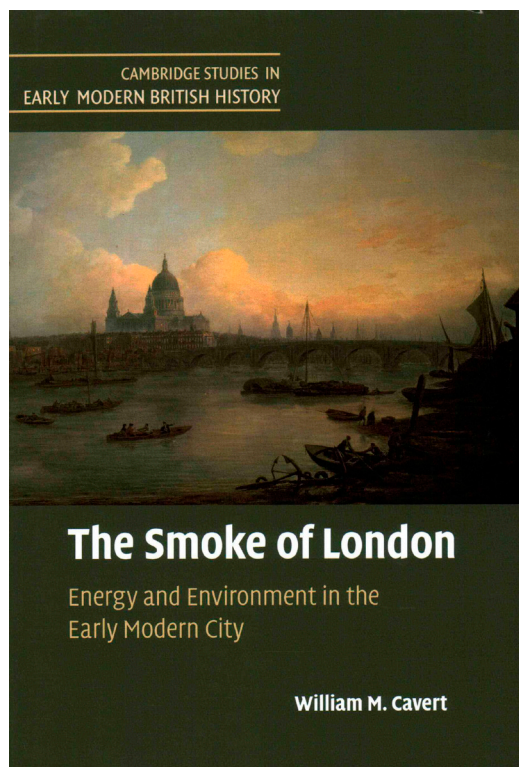
William M. Cavert, *The Smoke of London: Energy and Environment in the Early Modern City* (Cambridge: Cambridge University Press, 2016).

**Abstract**

This essay uses *The Smoke of London* (2016) as a springboard to engage with four questions of general interest to energy historians. The first addresses the notion of resource scarcities; the second addresses "socio-cultural biographies" of natural resources; the third discusses embodied knowledge about natural resources; and the fourth discusses energy determinism.

**Plan of the article**

- After the Smoke Clears
- The Nef Thesis Revisited
- The "Socio-Material Identity" of Coal
- Coal-miners and the Scientific Revolution
- The Transition to Coal and Energy Determinism
- Conclusion



### AFTER THE SMOKE CLEARS

- 1 What is left to say about the history of coal, broadly construed, in 17<sup>th</sup> C. and 18<sup>th</sup> C. Britain? Substantially less, one might reply, than in 2015. For William M. Cavert's *The Smoke of London* (2016) said a lot indeed. Cavert's (multi-) award-winning monograph was presented as an environmental history, but reviewers were quick to point out that it made significant contributions to economic, political, and social history, as well as to the history of science. Taking the widespread British transition from wood to coal in the years preceding 1600 as his object of inquiry, Cavert demonstrates that early modern Londoners were highly concerned about the notorious coal smoke associated with this change in energy regime for a variety of aesthetic, property-related, and health reasons. Ultimately, however, those with the power to make decisions – including a succession of Tudor and Stuart monarchs – came to accept coal smoke as an inevitable if frustrating by-product of the coal-fuelled economy that they relied on for stability and control. Ordinary Londoners, on the other hand, had, of course, to accept coal on the whim of the monarch, but they also had to accept it

for access to a cheap supply of energy. Thus, Cavert recovers the previously unappreciated early modern concern about air pollution, showing that this in fact predated the 19<sup>th</sup> C. rise of industrial capitalism previously argued to have catalysed widespread environmental concern.<sup>1</sup> More pressingly, Cavert teaches us that apathy to pollution on behalf of those with power has a long history, and that economic concerns have triumphed over environmental concerns ever since the dawn of what he calls (justifiably, “from the perspective of energy regimes”) “the first modern society”.<sup>2</sup>

There is no space here to critically engage with every aspect of Cavert's excellent book. This review essay instead uses the book as a springboard to engage with four questions of more general interest to energy and environmental historians, before suggesting lines of future research. Accordingly, the essay is comprised of four sections. The first addresses the notion of resource scarcities through a discussion of the controversial 17<sup>th</sup> C. “timber famine”, situating Cavert's work alongside that of Paul Warde on the psychological aspects of assumed resource scarcities. The second turns to the “socio-cultural biographies” of natural resources, contending that future work should engage with the recent scholarship of Lissa Roberts, Joppe van Driel, and Naomi Yuval-Naeh in order to extend Cavert's anthropological approach to coal. The third discusses mineworkers, the historical actors that are necessarily left out of *The Smoke of London*, and it suggests that recent work in the history of science offers a way of integrating them into Cavert's story. The fourth, finally, sets *The Smoke of London* in dialogue with Thomas Turnbull's recent article on energy determinism and the teleological narrative of energy transitions.

<sup>1</sup> See, for example, Stephen Mosely, *The Chimney of the World: A History of Smoke Pollution in Victorian and Edwardian Manchester* (Cambridge: Cambridge University Press, 2001).

<sup>2</sup> William M. Cavert, *The Smoke of London: Energy and Environment in the Early Modern City* (Cambridge: Cambridge University Press, 2016), xviii.

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### THE NEF THESIS REVISITED

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- 3 In 1932, J.U. Nef argued that a 17<sup>th</sup> C. timber scarcity prompted the widespread adoption of coal, leading to “something like a revolution in the use of fuel”.<sup>3</sup> On Nef’s account, the inefficiency of wood combustion, Royal Commissioners’ reports on forests, and increased wood prices all pointed to the fact that between the mid-16<sup>th</sup> C. and the mid-17<sup>th</sup> C., Britain witnessed “an acute shortage of wood”.<sup>4</sup> Thus explained, Nef argued, the fourteen-fold increase in coal production he identified in the same period.<sup>5</sup>
- 4 Nef’s evidential base was soon attacked by historians who doubted the tangible presence of a timber crisis.<sup>6</sup> In *The Smoke of London*, however, Cavert is necessarily critical but also charitable to Nef. As Peter Thorsheim has already noted, Cavert’s original archival research on coal duties – provided in Chapter 2 – has added new estimates for coal consumption between the 1550s and the 1680s, an estimate that filled a much needed gap in economic history.<sup>7</sup> These findings naturally “confirmed Nef’s overall picture of urban coal imports growing dramatically during the late 16<sup>th</sup> C.,” but Cavert does concede that Nef’s “description of a universal timber famine is not really defensible”.<sup>8</sup>
- 5 However, Cavert then goes on to provide his own interpretation of the timber famine, which is most illuminating. He does not argue for the presence of a national crisis, but he does argue that there was a noticeable decline in wood supply that led to an uptake in coal. There were three reasons for this. First, available woods

were often, in practice, inaccessible; second, short-term thinking led to the unsustainable felling of many trees for immediate profit; and, most importantly, however small the actual decline in trees there was a widespread perceived fear of an impending crisis. Such fears, Cavert shows us, were expressed by the landed gentry, the brewing industry, and even the Privy Council.<sup>9</sup> “Coal therefore, became London’s fuel exactly when contemporaries believed that wood’s availability had become threatened”, Cavert concludes.<sup>10</sup> Nef was wrong about the scale of the crisis, then, but Cavert also demonstrates that his argument remains quite convincing in important ways.

Here, Cavert’s work has an important connection to the scholarship of Paul Warde, an environmental historian who has argued elsewhere that early modern wood crises were often assumed rather than actual.<sup>11</sup> Such conclusions are surely important. One wonders, though, to what extent similar, comparative research could be completed on other natural resources and energy sources. What environmental and energy history might profit from next, I suggest, is a series of localised studies, fine-grained and micro-historical in scope, examining resource shortages – real or otherwise – in other periods and locations. If Warde and Cavert teach us anything in this respect, it is that the old Annales School approach to the environment, divorced in the main from human “events”, overlooks just how mutually interdependent the natural and the cognitive landscapes of the past were.

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### THE “SOCIO-MATERIAL IDENTITY” OF COAL

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It is worth discussing Cavert’s approach to coal in light of two more recent treatments of coal in the historical literature: Lissa Roberts and Joppe

<sup>3</sup> John Ulric Nef, *The Rise of the British Coal Industry*, 2 vols. (London: George Routledge, 1932), vol. 1, 20.

<sup>4</sup> *Ibid.*, 161.

<sup>5</sup> *Ibid.*, 120.

<sup>6</sup> D.C. Coleman, “The Coal Industry: A Rejoinder”, *The Economic History Review*, vol. 30, n? 2, 1977, 343-345; John Hatcher, *The History of the British Coal Industry. Volume 1 Before 1700: Towards the Age of Coal* (Oxford: Clarendon Press, 1993).

<sup>7</sup> Peter Thorsheim, “Comments by Peter Thorsheim, UNC Charlotte”, *H-Environment Roundtable Reviews*, vol. 9, n? 9, 2019, 15.

<sup>8</sup> William M. Cavert, *The Smoke of London*, 19, 24 (cf. note 2).

<sup>9</sup> *Ibid.*, 20-22.

<sup>10</sup> *Ibid.*, 21.

<sup>11</sup> Paul Warde, “Fear of Wood Shortage and the Reality of the Woodland in Europe, c. 1450-1850”, *History Workshop Journal*, n? 62, 2006, 28-57; Paul Warde, “Early Modern ‘Resource Crisis’: The Wood Shortage Debates in Europe”, in A.T. Brown, Andy Burn, Rob Doherty (eds.), *Crises in Economic and Social History: A Comparative Perspective* (Martlesham: Boydell Press, 2015), 137-160.

van Driel's "The Case of Coal" (2017) and Naomi Yuval-Naeh's "Cultivating the Carboniferous: Coal as Botanical Curiosity in Victorian Culture" (2019). Both of these papers take what can fairly be called a socio-cultural – or, to use Roberts and van Driel's preferred term, "socio-material" – approach to coal.<sup>12</sup> That is, they do not consider coal in a teleological way as a predetermined "fossil fuel", and they are interested in broader, cultural understandings of coal.

8 Roberts and van Driel set out to show that the "historical identity of coal evolved through a fluid amalgam of material characteristics and applications, knowledge claims, technological capabilities, market transactions and political decisions".<sup>13</sup> Their paper thus shows us how, in Britain and France over the course of the long 18<sup>th</sup> C., legal disputes, rival taxonomic schemes, taxation programmes, and plans for agricultural improvement all contributed to shaping coal's material identity, one that is still contested today. Indeed, geoscientists have argued that it makes sense to see various coals as highly-localised natural products, and yet, for economic convenience, a four-fold taxonomic scheme (lignite, sub-bituminous, bituminous, and anthracite) is nevertheless still widely in place.<sup>14</sup> Yuval-Naeh focuses more specifically on Victorian Britain, demonstrating that – besides its practical uses – coal was seen by the middling- and upper-classes as a botanical wonder, "a relic of the deep past".<sup>15</sup> As geo-historical science became fashionable, the botanical origin of coal "provided alternative imagery for one of Britain's darkest and harshest environments – the coal mine – by pasting pastoral scenes of luxuriant forests over the underground arena of social struggle".<sup>16</sup>

<sup>12</sup> Lissa Roberts and Joppe van Driel, "The Case of Coal", in Lissa Roberts and Simon Werrett (eds.), *Compound Histories: Materials, Governance and Production, 1760-1840* (Leiden: Brill, 2017), 57-84 (57).

<sup>13</sup> *Id.*

<sup>14</sup> *Ibid.*, 59-62.

<sup>15</sup> Naomi Yuval-Naeh, "Cultivating the Carboniferous: Coal as a Botanical Curiosity in Victorian Culture", *Victorian Studies*, vol. 61, n° 3, 2019, 419-445 (419).

<sup>16</sup> *Ibid.*, 440.

9 Although Cavert provides a similarly socio-cultural discussion of coal smoke in early modern London, coal does not get the same treatment. He does, however, indicate that he favours an anthropological approach to coal by stating that he sees coal "as one of the many 'things' that became essential to the emergence of a certain kind of society", while citing Arjun Appadurai's acclaimed edited volume *The Social Life of Things* (1986). If future research can give 17<sup>th</sup> C. and early 18<sup>th</sup> C. attitudes to coal in Britain the same treatment that Roberts, van Driel, and Yuval-Naeh give later attitudes (or the treatment that Cavert gives coal smoke), then one paper from *The Social Life of Things* becomes particularly relevant. In his contribution, William Reddy examined two trade dictionaries to highlight how the French Revolution instigated a new "commercial Weltanschauung" about textiles: before the Revolution detailed connoisseurship was crucial; afterwards the production process took on a new significance.<sup>17</sup> Tracing such changes in the socio-cultural biography of coal – and indeed all natural resources – has the potential to tell us much about the historical importance of coal, as fuel or otherwise.

### COAL-MINERS AND THE SCIENTIFIC REVOLUTION

10 Cavert's argument in Chapter 6, "Smoke in the scientific revolution", is nuanced and convincing: coal smoke was widely believed to be harmful by certain (but not all) physicians to certain (but not all) types of person, but the physicians had a difficult job proving this empirically; they were therefore only ever partially successful. They could, for instance, persuade 17<sup>th</sup> C. demographers that coal smoke might have slightly influenced Londoners' comparatively short life expectancy, but that this was largely the result of moral and social degeneracy. In making this argument, Cavert manages to explain and reconcile the divergent approaches to coal smoke taken by historians of medicine and literary critics.<sup>18</sup>

<sup>17</sup> William M. Reddy, "The Structure of a Cultural Crisis: Thinking about Cloth in France Before and After the Revolution", in Arjun Appadurai (ed.), *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 2014), 261-284 (265).

<sup>18</sup> On these narratives see William M. Cavert, *The Smoke of London*, 80-81 (cf. note 2).



11 Physicians and demographers thus get the lion's share of Cavert's attention in Chapter 6, with some attention going to Robert Boyle and John Locke, amongst others, in so far as their chemical work related to medical theory.<sup>19</sup> This works for Cavert's study, with its focus on those aspects of "science" that related most pressing to the concerns of early modern Londoners. But Cavert, I believe, would agree that a comprehensive history of coal smoke as it related to the alleged 17<sup>th</sup> C. and early 18<sup>th</sup> C. scientific revolution would demand more than one chapter's worth of material.

12 Although Cavert briefly mentions the Baconian practice of writing weather diaries "championed by members of the Royal Society", his omission of one of the fellows' similarly Baconian practices – that of taking excursions into mines – is surprising. In 1666, Boyle listed 101 "Inquiries Touching Mines" and he actively encouraged the fellows of the Royal Society to visit mines as valuable sites of natural inquiry. Four of Boyle's inquiries seem particularly relevant to Cavert's topic: numbers 6, 17, 24, and 38 all addressed mine vapours and damp. <sup>20</sup> And, true to Bacon, Boyle suggested that the fellows sought the first-hand testimony of the mineworkers to respond to many of his inquiries: "What Methods the Mine-men use in following the Vein...", and "How the Miners deal with Rocks and Sparrs..." were but two examples.<sup>21</sup> Many of the fellows that responded to Boyle's inquiries researched metal-mines, but a number of published papers in the *Philosophical Transactions of the Royal Society* did address coal-mines: "That damp naturally fire of themselves, we have the general Testimony of Miners, and [Henry Power]", Martin Lister wrote in a 1684 paper about coal pyrites.<sup>22</sup> The fellows of the Royal Society, then,

were one subset of early modern Londoners that certainly did not ignore the experiences of mineworkers.<sup>23</sup>

Such research would necessarily centre on coalfields at a distance from London. Yet Cavert's story about the metropole could only be enriched by new provincial stories. My point is that future work should examine any connections between natural philosophical understandings of coal damp and vapours on the one hand, and, on the other, the smoke emitted from the mass consumption of coal in cities like London. Were they seen as separate entities? Did natural philosophers see any relationship between them? Was the embodied understanding of damp and vapours possessed by coal-miners of use to natural philosophers, or was this a merely tacit kind of knowledge that could not be appreciated by them? 13

Such research questions may fruitfully be explored by considering coal-mines as "trading zones" in the vein of Pamela O. Long, where vernacular, practical expertise and learned natural knowledge coalesced.<sup>24</sup> A careful reading of natural philosophers' observations of miners may prove revealing. Connections can then be drawn from the natural philosophical work on damp and vapours, and the work on smoke. By focusing on the experiences of mineworkers, their bodily knowledge of the coalfield environment, and the natural knowledge that natural philosophers drew from them in turn, this work would complement Cavert's research by telling the other part of the story. 14

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### THE TRANSITION TO COAL AND ENERGY DETERMINISM

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Thomas Turnbull has recently decried determinism in energy history, calling for a more nuanced approach that sees energy as an 15

<sup>19</sup> *Ibid.*, 88.

<sup>20</sup> Robert Boyle, "Articles of Inquiries Touching Mines", *Philosophical Transactions of the Royal Society*, vol. 1, 1666, 330–343.

<sup>21</sup> *Ibid.*, 335–336.

<sup>22</sup> Martin Lister, "The Second Paper of the Same Person Concerning the Spontaneous Firing of the Pyrites", *Philosophical Transactions of the Royal Society*, vol. 14, 1684, 515–517 (516).

<sup>23</sup> William M. Cavert, *The Smoke of London*, 18 (cf. note 2).

<sup>24</sup> Pamela O. Long, *Artisan/Practitioners and the Rise of the New Sciences, 1400–1600* (Corvallis: Oregon State University Press, 2011), chapter 4.

“inter-dependent historical agent”.<sup>25</sup> By conducting a close reading of Nef, E.A. Wrigley, and Rolf Sieferle, Turnbull shows us that these “original energy historians” developed much more qualified arguments about energy transitions than subsequent generations of historians have suggested. Crucially, Turnbull also argues that each of the three writers’ historical interpretations were conditioned by their own perceptions of contemporary environmental crises. “This should encourage us”, Turnbull claims. “Our future is not preordained, rather there is great potential to redefine society’s relation to energy”.<sup>26</sup>

16 Following Turnbull, could one then see Cavert’s argument as reflecting the perceived apathy of current world readers to climate change? Perhaps – but it would be harder to dispute the wealth of empirical sources that Cavert draws upon that, on this reading, just so happen to support his argument. And at any rate, to read too much into Turnbull’s stance on “historiography as a form of ‘environmental’ history” would somewhat contradict his persuasive stance against determinism.<sup>27</sup> Cavert’s work is not the least bit deterministic, offering a thorough-going

dissection of early modern London’s relation to energy and qualifying how, despite the negatives, coal took off regardless. Human behaviour is central to Cavert’s story, just as Turnbull would hope. Despite the distance of some 400 years, there are nonetheless striking parallels between early modern Londoners’ begrudging acceptance of coal, and the acceptance found in other corners of the modern world. The stark lesson from Cavert’s study is that the opportunity to redefine society’s relation to energy will be no easy feat. If energy regimes are not deterministic, can the same be said for human apathy?

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## CONCLUSION

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To summarise on a less bleak note: William Cavert’s *The Smoke of London* is an excellent 17 book. It is of interest, of course, to early modern environmental historians but, as I hope to have demonstrated here, the themes it addresses ensure that it demands a broader readership. Responses to the suggestions for future research made here would be most welcome, no doubt, in the pages of *Journal of Energy History* / *Revue d’Histoire de l’Énergie*.

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<sup>25</sup> Thomas Turnbull, “Energy, History, and the Humanities: Against a New Determinism”, *History and Technology*, vol. 37, n° 2, 2021, 247-292 (273).

<sup>26</sup> *Ibid.*, 274.

<sup>27</sup> *Ibid.*, 248.

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