

## **The Shock of the Anthropocene (Christophe Bonneuil and Jean-Baptiste Fressoz, 2017)**

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### **Abstract**

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Christophe Bonneuil and Jean-Baptiste Fressoz offer a provocative programme for history in the Anthropocene. They propose a form of minoritarian environmental history. Within this argument, they take aim at energy history “as currently practised”. This essay addresses the authors' proposed reforms.

# Article

In this English translation of a French text first published in 2013, and in an expanded form in 2016, historians Christophe Bonneuil and Jean-Baptiste Fressoz offer a provocative programme for history in the Anthropocene.<sup>1</sup> Their book is a work of synthesis that addresses the consequences of this contentious new epoch from a distinct Francophone perspective. In a wide-ranging argument they propose seven registers for thinking about the past in light of this possible new future. These range from the *Thanatocene*, the age of “deadlier and more frequent” war, to the *Polemocene*, the marginalised histories of opposition to the ecologically misguided tenets of free market economics.<sup>2</sup> In this vein, they propose a form of minoritarian environmental history “to guard against the scientific illusion that ecological awareness and ‘salvation’ can only come from scientists and not also from the struggles and initiatives of other Earthlings and citizens of the planet”.<sup>3</sup> Within this argument, they take aim at energy history “as currently practised”, and their proposed reforms to this discipline should be of particular interest to readers of this journal.<sup>4</sup> This essay addresses the authors' proposed reforms, though it begins with more general questions regarding energy history as a discipline.

Exactly what is energy history? Does it involve the natural history of energy or the history of human awareness of energy's historical agency, or both? Should it begin from the Big Bang, the human use of fire, the discovery of laws of thermodynamics, industrialisation, or the energy crises of the 1970s?<sup>5</sup> That last event led historian of chemistry Arthur Donovan, then editor of *Materials and Society*, to dedicate a 1983 issue of the journal to this new speciality. The journal before you is not the first time energy historians have pronounced the need for their own discipline. The 1970's crisis had affirmed energy's historical agency, but for the analysis of this relation to succeed, Donovan wrote, “the history of energy must be defined and guided by a clear conception of its proper range and purpose”.<sup>6</sup> And again, in the wake of the 1992 United Nations Climate Change Agreement for example, a special issue of the *British Journal of the History of Science*, historian of biology Robert Olby editorialised that “triumphalist” narratives of progressive mastery over the physical world “no longer continues unquestioned in energy history”.<sup>7</sup> Clearly the range and purpose of our field is constantly altered by our changing relation to energy.

Does the way we formulate our discipline matter? *Energy history*, like environmental history, emphasises the agency of energy, perhaps even implying energy determinism. Whilst *the history of energy* (or should that be *histories* of energy?), indicate the object of inquiry will be historicised, as it is in the history of physics. This is not word play, such considerations are central to defining disciplinary range and purpose. Yet again, there are antecedents. In 1908 chemist-philosopher Émile Meyerson considered energy merely a special example of a general “causal postulate”, a human propensity to explain change in relation to unchanging metaphysical quantities.<sup>8</sup> In which case, isolating energy over

other aspects of causation would be strange. By contrast, in 1910 historian Henry Adams argued that if you took the laws of energy to their ultimate conclusion then the inescapable dynamic of entropy, the dissipation of useful energy, explained everything: all history was energy history.<sup>9</sup> Written soon after Wilhelm Ostwald's theory of energetics, which reduced history to "man's advancing control over energy", one suggestion is that Adams's argument was an elaborate joke, a *reductio ad absurdum* critique of scientific modes of historical explanation.<sup>10</sup> The jurisdiction of energy history surely lies somewhere between these two extremes? Of course the human use of energy has been historically consequent, but it would be absurd to offer over-essentialised explanations that ignore the role of knowledge, technology, and society, *inter alia*, as co-determinant aspects of that history.

In their book, Bonneuil and Fressoz argue that evidence of the extent of human environmental impact should be cause for a reformation in energy history. In their view the Anthropocene, an event "characterized by an unprecedented upsurge in energy mobilization" offers an opportunity to explain how historical change can be both energetically and socially determined.<sup>11</sup> The idea's principle advocates, atmospheric chemist Paul Crutzen and biologist Eugene Stoermer argue that human action has created a new epoch in Earth's geochronology. To understand the gravity of this claim it should be appreciated that the last epoch, the Holocene, began eleven-thousand years ago when the last ice age ended. They first suggested this new epoch began in 1784 with James Watt's invention of the steam engine, which meant vast reserves of fossil energy could now be exploited. Over the next 250 years a forty-fold increase in energy consumption occurred. The agency afforded by this unprecedented combustion transformed Earth's ecological, climatological, and geological systems, with possibly deleterious and certainly transformative consequences for humankind. On this basis, Bonneuil and Fressoz argue the availability of energy partly dictated the scale and properties of human history whilst humans expanded this availability by prospecting and inventing new modes of exploitation. This reciprocity, they argue, transformed human and environmental history, and perhaps now even geological time. If energy historians are to appropriately explain their subject of inquiry in this new epoch, the authors' argue, they must develop an 'understanding of the energy and matter metabolism operated in and by the social system that is as fine-grained as the analysis of biogeochemical flows in the Earth system'.<sup>12</sup>

Rather than advocating a fusion of earth systems science and cliometrics as one might imagine, Bonneuil and Fressoz suggest that energy history must do two things: apportion blame for our current predicament, and study the history of divergences from this trajectory rather than those actions that led us here. Borrowing a term from French radical ecologists, they term this *Thermocene* history. Without this more radical stance they fear current mitigation proposals that involve geo-engineering and will be overseen by the world's leading scientists provide only a 'new modernist fable', a reaffirmation of our assumed mastery of nature.<sup>13</sup> Worse yet, a response diffuses blame over an undifferentiated humanity, failing to consider changing the specific "actors, institutions, and decisions that have produced these effects".<sup>14</sup> So as part of a larger aim of

identifying “Who is the Anthropos?” in the authors' proposed reforms we energy historians are tasked with writing political histories of carbon dioxide, accounts that ask: who burnt all the hydrocarbons?

To make this point, the authors take ‘energy history as currently practised’ to task. Current practitioners, they argue, place too high expectations on the study of past energy transitions as means to inform a low-carbon transition. They warn such “energy history with a managerial approach” misdirects attention to a misleading notion. What look like segues between fuels are perspectival or scalar tricks that mistake relative change for absolute. Hence they argue that the “history of energy is not one of transitions, but rather of successive *additions* of new sources of primary energy”.<sup>15</sup> Given the widely accepted objective of reducing global energy use, as means to reduce human impacts on earth’s systems, to study past transitions is to understand how we got into this situation rather than how we get out. As such, they advise that we abandon the very concept of transition. But in doing so, they rightly acknowledge the phrase has its own history. It was an anxiolytic managerial term used to allay fears during the energy crises of the nineteen-seventies.<sup>16</sup> But I would argue that this does not invalidate the term’s historical significance, far from it. In a certain context, actor’s use of the term transition, borrowed from natural science, is revealed as a synonym of that pre-eminent signifier of historical change, crisis.<sup>17</sup>

Moreover, the idea that we should dispense with transition as an analytic because such changes occur only in localised ways is at odds with their stated aim of specifying the Anthropos. In 1932 economic historian John Nef, considered the first serious energy historian, gave a detailed account of the substitution of coal for wood in sixteenth and seventeenth century British industry. Though his quantitative evidence has been criticised, his account of “something like a revolution in the use of fuel” remains an important account of how a certain structure of energy use arose at a specific time and place.<sup>18</sup> More recently, Andreas Malm’s account of the role of capital in effecting a transition from waterpower to coal in the cotton mills of northern England, though situated in a specific geography, is presented as an event which assumed geohistorical importance in subsequent decades.<sup>19</sup> It would not be a shock to learn that wood, charcoal, and waterpower were still used in significant amounts long after these events, but to deny nothing of significance took place, because transitions did not involve wholesale movements between fuels or result in aggregate reductions in energy use, proposes a slightly absurd form of non-history, to borrow Quentin Skinner’s phrase.<sup>20</sup>

Thankfully Bonneuil and Fressoz find aspects of current energy history to commend. They are thankful to past work for revealing how transitions have been determined by energy demand rather than supply. However, an unfortunate illustration is offered. They write ‘the filament lamp created electric power stations, and not the other way around’.<sup>21</sup> In fact leading historian of electrification Thomas Hughes made almost the inverse argument. Alongside the provision of light, bulbs demonstrated the usefulness of his underutilised Pearl Street power plant and helped balance its electrical load. The bulb was less a discrete object, so much as a “parallel system of distribution” allowing the

“indefinite subdivision of light” at low cost.<sup>22</sup> Hughes’s account suggests demand for electric light was something that was constructed, rather than some persistent entity called demand being met by the bulb’s invention.<sup>23</sup> Though a minor difference in interpretation, this indicates a more general tendency. In a rush to differentiate their Thermocene history, on occasion the authors mischaracterise and oversimplify the work of past energy historians.

This mischaracterisation extends to their critique of contemporary “managerial” energy history. Whilst there is a seductive heterodoxy to the idea that transition is a foil for ever more energy use, a quick survey reveals that scholars rarely fall for this trick. Historian Bruce Podobnik acknowledges that relative decline in coal use in certain places does not counter how “in absolute terms, world coal production has increased in the post-World War II period and is projected to do so well into the next century”.<sup>24</sup> Energy analyst Benjamin Sovacool states that transitions are mostly “cumulative rather than fully substitutive”.<sup>25</sup> Whilst economic historian Roger Fouquet observes “past energy transitions have been characterised by major increases in energy consumption”.<sup>26</sup> Podobnik and Fouquet are cited in the book, but their inconvenient disagreement with its narrative is not.<sup>27</sup> I agree with the authors that the term transition has been used as a misleadingly in certain public discourses and that these should be brought to account but beyond our authors’ argument it is hard to find historians who are transition dopes.<sup>28</sup>

How can such mischaracterisation of energy historians be avoided? Geographers have recently debated the desirability of establishing a canon, a set of authoritative disciplinary texts. Whilst acknowledging risks of bias and exclusion, a conclusion was that canons offer a shared set of arguments from which new scholarship can emerge.<sup>29</sup> For historians of energy a canon should no doubt include Nef and Wrigley. Such a canon could also include historians of science, whose have historicised the concept of energy since their discipline’s inception.<sup>30</sup> More generally, French scholars have their own environmentalist tradition stretching as far back as far as geographer Vidal de la Blache. His notion of possibilism, reciprocity rather than crude determinism between nature and society, presaged our authors’ “double notion of internality”, the recognition of the social in the natural and the natural in the social.<sup>31</sup> Another antecedent might be French Communist geographer Pierre George, author of the first monograph on the geography of energy which presaged later radical geographers in arguing that energy availability was a factor of social relations.<sup>32</sup> Not forgetting the Annales school, whose descriptive historical quantification led Fernand Braudel to write “geohistory”, change over geographical time.<sup>33</sup> More recently, historians Jean-Paul Deléage, Jean-Claude Debeir and physicist Daniel Hémery combined ecological Marxism with global history to offer a critical history of energy use, sharpened by their opposition to the French nuclear industry.<sup>34</sup> Such canonical works require respectful reconsideration to avoid reinventing past findings and do justice to past historians.

Criticisms aside, there is plenty to commend in their call for a “disorientated” history of energy, a term they derive from Fressoz’s earlier involvement with *Entropia*, a journal of the French de-growth movement.<sup>35</sup> In that journal disorientation is presented as both a

historical juncture and mode of inquiry.<sup>36</sup> Bonneuil and Fressoz argue that energy history can disorientate by relativising and denaturalising our energy system by revealing how this destination was not reached by some inexorable teleology of progress and efficiency, but at times by poor business practices, collusion, and the suppression of certain technologies. Disorientation rightly emphasises the rich histories of opposition to the hegemony of fossil fuels, from Manhattan Project physicists turned solar energy pioneers to the subsidisation of public transport in Weimar Germany.<sup>37</sup> They hope to unsettle the idea that historical expertise can be an informational input to a pre-determined low carbon transition. In doing so, rather than distinguishing themselves, they join conventional energy historians who are already disavowing the idea that they can offer “pre-packaged policy proposals”.<sup>38</sup>

As part of the process of disorientation I do not agree that we must free ourselves from “the very concept of energy”.<sup>39</sup> In a confusing and far too concise argument the authors claim historians’ use of energy statistics can mislead. Units, such as “energy use per capita” they argue, record “the energy theoretically available” from a given quantity of fuel rather than the actual energy derived in combustion. This abstraction, they suggest, “likely overestimates the upheaval introduced by fossil fuels”<sup>40</sup>. To me, this suggests the need for *greater* consideration of the energy concept. As geographer Andrew Barry has suggested, in discussing energy, social scientists tend to focus on specific resources and technologies of extraction and use, failing to consider energy as it is understood in physics or engineering, as a measurement of a system’s ability to do work.<sup>41</sup> Put another way, why not try to write histories of actually derived energy which focus on energy conversion? Bonneuil and Fressoz’s argument does not address the concept of energy so much criticise the way in which fuel-use enters national accounting. This raises a larger disciplinary question, what distinguishes energy history from resource histories or the history of technology? Clearly a focus on energy as it is understood in physics and engineering offers one distinction.

A point of agreement comes when the authors rightly suggest that triumphant accounts of progressive efficiency increases can be revealed as histories of inefficiency if suitably disorientated by extending the scale of analysis, whether it be the introduction of gas-lighting in Paris or the mechanisation of agriculture during the Green Revolution.<sup>42</sup> Moreover, their proposal for a “general history of thermodynamic (in)efficiency”, mentioned only briefly, opens the prospect of a new form of energy history.<sup>43</sup> Why not write energy history in response to the idea of the technosphere rather than the Anthropocene? The idea of the technosphere, proposed by Anthropocene-advocate and geologist Peter Haff, unmentioned in the book under review, is that the vast networked infrastructure of earth’s terrestrial technologies rather than humans themselves are the preeminent terrestrial agent. Moreover, Haff argues the technosphere’s only discernible telos seems to be the maximisation of entropy.<sup>44</sup> Taken seriously, and heeding Adam’s possibly parodic warning, the history of energy told as the result of the unceasing increase of entropy suggests a new mode of explanation that can account for the unfortunate ironies and limits of the human pursuit of energy efficiency.

Another of their proposed means of disorientation is to study “histories of energy degrowth”, the circumstances and effects of dramatic decreases in energy use at various points in history, such as the Great Depression, in post-war Germany, and during the fall of the Soviet Union. Whilst this shift in perspective is welcome, these were exceptional events. Why not consider more commonplace histories of attempts, failures, and successes in reducing energy consumption via rationing, increased efficiency, or conservation efforts?<sup>45</sup> The authors are uninterested in such prosaic histories because, as they suggest, the global history of energy seems to affirm Jevons’ paradox: despite significant increases in energy efficiency, the rate and scale of energy use still climbs.<sup>46</sup> But, as with transitions, increases in efficiency are clearly of regional consequence. Historical geographer Anthony Wrigley, for example, described how differences in the efficiency of energy production along a rich coal seam stretching from Pas-de Calais to Westphalia correlated with patterns of societal development.<sup>47</sup> Whilst detailed studies at the scale of cities or specific industries can go beyond platitudes in detailing the range of motivations underlying the pursuit of efficiency.<sup>48</sup> Moreover, the authors would surely categorise claims that increased efficiency has allowed certain nations to “decouple” economic growth from energy consumption as “agnotological”, to use their borrowed term for the constructed ignorance of geophysical fact, given ample evidence of the outsourcing of energy-intensive manufacturing that has occurred in such countries.<sup>49</sup> These points are less criticisms, than acknowledgements that the authors’ provocations succeed in encouraging new approaches to doing energy history, and for this they should be commended.

However, whilst there are undoubtedly historians who unquestioningly surrender themselves to an elitist Anthropocene “solutionism” who should heed Bonneuil and Fressoz’s ire, they in turn should not dismiss scholars who are well aware of the limits of terms like transition and the contradictions of efficient energy use, but still consider these things of great historical importance. More generally, energy historians should applaud the

authors' idea that the Anthropocene requires historians to take natural science more seriously and natural scientists to take social history more seriously. Historians must engage with principles such as thermodynamics but equally atmospheric chemists must consider sociological modes of explanation in their explanatory schemes. And if energy historians are to take this epoch seriously, we must demonstrate the effectiveness of energy history to explain change in a world in which simple accounts of environmental or human determinism are no longer credible. Whether or not the Anthropocene becomes an official period in Earth history, the ongoing debate affirms a more complicated conception of human and environmental agency, which is something the most perceptive historians, as our authors recognise, have always understood.<sup>50</sup>



## Notes

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1. Christophe Bonneuil, Jean-Baptiste Fressoz, *L'Événement Anthropocène: La Terre, l'histoire et nous* (Paris : Éditions du Seuil, 2016 [2013]).
2. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, trans. David Fernbach (London, New York: Verso, 2017), 122, 253.
3. *Ibid.*, 287.
4. *Ibid.*, 100.
5. So-called “big” histories often claim the formation of the universe is the rightful starting point of history, see Yuval Harari, *Sapiens: A Brief History of Humankind* (New York: Harper, 2015).
6. Arthur Donovan, “Preface”, *Materials and Society*, vol. 7, no 3-4, 1983, 243-245.
7. Robert Olby, “Introduction”, *British Journal for the History of Science*, vol. 26, no 1, 1993, 1-3.
8. Philip Mirowski, *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics* (Cambridge: Cambridge University Press, 1989), 5-7.
9. Henry Adams, *A letter to American teachers of history* (Washington: J.H Furst Co., 1910).
10. Wilhelm Ostwald, “The Modern Theory of Energetics”, *The Monist*, vol. 17, no 4, 1907, 481-515; Howard Munford, “Henry Adams and the Tendency of History”, *The New England Quarterly*, vol. 32, no 1, 1959, 79-90.
11. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 9 (cf. note 2).
12. *Ibid.*, 35.
13. *Ibid.*, 79.
14. *Ibid.*, 70.
15. *Ibid.*, 101.
16. *Ibid.*, 102.
17. Reinhart Koselleck, Michaela Richter, ‘Crisis’, *Journal of the History of Ideas*, vol. 67, n° 2, 2005, 357-400.
18. John Nef, *The Rise of the British Coal Industry*, vol. 1 (London: George Routledge & Sons. 1932), 20.
19. Andreas Malm, “The origins of fossil capital: from water to steam in the British Cotton industry”, *Historical Materialism*, vol. 21, no 1, 2013, 15-68.
20. Quentin Skinner, “Meaning and Understanding in the History of Ideas”, *History and Theory*, vol. 8, no 1, 1969, 3-53.
21. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 100 (cf. note 2).
22. Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880-1930* (Baltimore: Johns Hopkins University Press, 1983), 31.
23. Bonneuil and Fressoz in Chapter 7, titled the ‘Phagocene’ (phago: to consume), decry such essentialisation, arguing that advertising constructs many of the desires which combustion fulfils,

Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 156. (cf. note 2).

24. Bruce Podobnik, "Toward a Sustainable Energy Regime: A Long-Wave Interpretation of Global Energy Shifts", *Technological Forecasting and Social Change*, vol. 62, n° 3, 1999, 155-172.

25. Benjamin Sovacool, "How long will it take? Conceptualizing the temporal dynamics of energy transitions", *Energy Research & Social Science*, vol. 13, 2016, 202-215.

26. Roger Fouquet, "Historical energy transitions: Speed, prices, and system transformation", *Energy Research & Social Science*, vol. 22, 2016, 7-12.

27. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 119, 101 (cf. note 2).

28. Ibid., 101.

29. Richard Powell, "Notes on a geographic canon? Measures, models, and scholarly enterprise", *Journal of Historical Geography*, vol. 49, 2015, 2-8.

30. George Sarton, "The discovery of the law of conservation of energy", *Isis*, vol. 13, no 1, 1929, 18-44.

31. Paul Vidal de la Blache, *Principles of Human Geography*, éd. Emmanuel de Martonne, trans. Millicent Bingham (London: Constable Publishers, 1965 [1926]); Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 36 (cf. note 2).

32. Pierre George, *Géographie de l'Énergie* (Paris : Librairie de Médecis, 1950).

33. Melvin Knight "The Geohistory of Fernand Braudel", *The Journal of Economic History*, vol. 10, no 2, 1950, 212-216.

34. Jean-Paul Deléage, Jean-Claude Debeir, Deniel Hémerly, *Les servitudes de la puissance: Une histoire de l'énergie* (Paris : Éditions Flammarion, 1986).

35. Jean-Baptiste Fressoz, « Pour une histoire désorientée de l'énergie », *Entropia: Revue d'étude théorique et politique de la décroissance*, n°15, automne 2013.

36. "a benevolent and oriented time must be abandoned, and in this respect we must reconsider the narratives we make of the past", my translation. Philippe Gruca, « Sept thèses sur l'histoire désorientée », *Entropia: Revue d'étude théorique et politique de la décroissance*, n°15, automne 2013.

37. Ibid., 112-6.

38. Richard Hirsh, Christopher Jones, "History's contributions to energy research and policy", *Energy Research & Social Science*, vol. 1, 2014, 106-111.

39. Ibid., 105.

40. Id.

41. Andrew Barry, "Thermodynamics, matter, politics", *Distinktion: Journal of Social Theory*, vol. 16, n°1, 2015, 110-125.

42. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 105-7 (cf. note 2).

43. Id.

44. Peter Haff, "Technology as a geological phenomenon: implications for human well-being",

Geological Society London, Special Publications, vol. 395, n°24, 2013, 301-309.

45. The history of energy conservation is a somewhat ignored and undertheorized aspect of energy history. I will return to this subject in the second issue of the *Journal of Energy History*.

46. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., 101 (cf. note 2).

47. Edward A. Wrigley, *Industrial Growth and Population Change: A Regional Study of the Coalfield Areas of North-west Europe in the Later Nineteenth Century* (Cambridge: Cambridge University Press, 1961), 31.

48. Timothy Moss, "Socio-technical change and the politics of urban infrastructure: Managing energy in Berlin between dictatorship and democracy", *Urban Studies*, vol. 51, n°7, 2014, 1432 - 1448, 1432.

49. For a critique of assertions of decoupling see Andreas Malm, "China as Chimney of the World: The Fossil Capital Hypothesis", *Organization & Environment*, vol. 25, n°2, 2012, 146-177.

50. Christophe Bonneuil, Jean-Baptiste Fressoz, *The Shock of the Anthropocene*, op. cit., xii (cf. note 2).

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