Infectious Liberty
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Published by Fordham University Press

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Infectious Liberty: Biopolitics between Romanticism and Liberalism.

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Preface

1. I was tempted during the copy-editing process to introduce various COVID-19 references into the chapters themselves: for example, comparing eighteenth-century efforts to alter the “normal” curve of smallpox mortality by means of the then-new practice of inoculation (see Chapters 1 and 2) with our own efforts “to flatten the curve” of COVID-19 infections; illustrating my point about the need of biopolitical campaigns to create “surfaces” that can both track and alter population-level dynamics (see Chapters 1, 2, 3) with our own often politically contentious efforts to develop contact-tracing systems that can accurately track who has been infected with COVID-19 and social-distancing protocols that can alter those infection patterns; and comparing concerns in the eighteenth century about the effects of smallpox infection on commerce and trade (see Chapters 1 and 5) with our own efforts to halt COVID-19 infections without simultaneously destroying businesses and national economies. However, I ultimately decided that these parallels would likely be fairly obvious to readers as well, and so they remain implicit in the chapters that follow.

2. The intuition that liberatory politics could not be dissociated from collective healthcare issues—that is, from biopolitics—was shared in the 1960s and 1970s by feminist groups, the Black Panthers, and gay rights activists, among others. On the importance of healthcare for 1970s feminist activists, see Sandra Morgen, Into Our Own Hands: The Women’s Health Movement in the United States, 1969–1990 (New Brunswick, NJ: Rutgers University Press, 2002); on the Black Panthers, see Alondra Nelson, Body and Soul: The Black Panther Party and the Fight against Medical Discrimination (Minneapolis: University of Minnesota Press, 2011); on gay rights activists, see Melinda Cooper, Family Values: Between Neoliberalism and the New Social Conservatism (New York: Zone, 2017), 167–214. Cooper provides an illuminating account of how neoliberals (often working in collaboration with neoconservatives) appropriated many elements of these movements by endorsing their suspicion of government and medical and pharmaceutical experts while at the same time dulling or eliminating their progressive and collectivist dimensions.

Introduction


10. Michel Foucault, *Society Must Be Defended: Lectures at the Collège de France, 1975–76*, trans. David Macey (New York: Picador, 2003), 242–43. Foucault distinguished between *disciplinary* and *biopolitical* power: “We have . . . two technologies of power which were established at different times and which were superimposed. One technique is disciplinary; it centers on the body, produces individualizing effects,
and manipulates the body as a source of forces that have to be rendered both useful and docile. And we also have a second technology which is centered not upon the body but upon life: a technology which brings together the mass effects of a population, which tries to control the series of random events that can occur in a living mass, a technology which tries to predict the probability of those events (by modifying it, if necessary), or at least tries to compensate for their effects. . . . Both technologies are obviously technologies of the body, but one is a technology in which the body is individualized as an organism endowed with capacities, while the other is a technology in which bodies are replaced by general biological processes” (249).

11. Russell Hardin, *Liberalism, Constitutionalism, and Democracy* (Oxford: Oxford University Press, 1999), 43. Hardin claims that political liberalism “began in the seventeenth century with the effort to establish a secular state in which some religious differences would be tolerated,” while economic liberalism emerged in the eighteenth century and “came into being without a party or an intellectual agenda” (42). The “core concern of political liberalism,” Hardin claims, “is the individual, while the dominant concern in the main, long tradition of economic liberalism that passes through Smith is focused on the general prosperity of the society, not on individual advantage” (43).

12. *Free to Choose: A Personal Statement* is the title of Milton and Rose D. Friedman’s extraordinarily successful neoliberal manifesto, first published in 1980 and subsequently turned into a ten-part US Public Broadcasting Station (PBS) special.


15. This point is arguably implicit in a text such as Armstrong’s, for she contends that the eighteenth- and nineteenth-century British novel did not mirror an existing set of norms but rather created new norms, to which readers then conformed. My focus in this book is upon what we might think of as the conditions of possibility for such norm creation, and my argument is that these conditions of possibility exceed the bourgeois, liberal frame within which literary critics have tended to restrict them.

16. Because my goal is to reclaim and rehabilitate biopolitics, rather than liberalism, and to do so by positioning liberalism as simply one mode of biopolitics, my goals diverge from the Victorian literary critic David Russell’s efforts to “reclaim or rehabilitate” aspects of Victorian liberalisms eclipsed either in that period or by subsequent versions of liberalism (most prominently, neoliberalism); David Russell, “Aesthetic Liberalism: John Stuart Mill as Essayist,” *Victorian Studies* 56, no. 1 (2013): 7–307. Russell points to David Wayne Thomas’s attempts to revive a liberal
understanding of agency that keeps its distance from both “liberalism as imperialism or as atomistic individualism” and to Amanda Anderson’s efforts to “recuperat[e] a liberal ethos of a rigorous critical reason that has been foreclosed by the successes of laissez-faire neoliberalism and poststructuralist theory alike” (7). Russell himself describes and promotes a version of “aesthetic liberalism” that, he argues, appears in John Stuart Mill’s essays. Though I do not seek to reclaim or rehabilitate earlier liberalisms, the fact that liberalism has grasped, arguably more fully than any other political tradition, the importance of individual difference for biopolitics means that my recuperative project also attempts to take seriously the various schools and histories of liberalism.


21. Recent examples of Victorian literary critical interest in liberalism include Lauren M. E. Goodlad, *Victorian Literature and the Victorian State: Character and Governance in a Liberal Society* (Baltimore, MD: Johns Hopkins University Press, 2003); Elaine Hadley, *Living Liberalism: Practical Citizenship in Mid-Victorian Britain* (Chicago: University of Chicago Press, 2010); and Kathleen Frederickson, *The Play of Instinct: Victorian Sciences of Nature and Sexuality in Liberal Governance* (New York: Fordham University Press, 2014). The centrality of liberalism for Victorian literary scholars is partly explained by the fact that it was during this literary period that members of a political party began referring to themselves as “Liberals” and created an explicitly titled “Liberal Party” in 1859. However, to restrict liberalism to the emergence of a party bearing that name risks discounting the long history of earlier uses of the term “liberal” as well as the importance of “the emancipatory movements of the liberals in
Spain and the insurgents in Italy and Greece, which erupted in the second and third decades of the nineteenth century and which were supported spiritually and materially by Shelley, Byron, Hazlitt, and Hunt.” Christensen, *Romanticism at the End of History*, 146. Focusing on the emergence of the Liberal political party also risks missing the earlier development of those concepts and techniques that were adopted by the Liberal Party. For a brief, but helpful, account of uses of the term “liberal” in the late eighteenth century as both an adjective (e.g., “a liberal system of policy”) and a nominative (e.g., a 1780 letter in the *Pennsylvania Packet* advocated for the abolition of slavery and was signed “A Liberal”), see Losurdo, *Liberalism*, 58–59, 241–46.

22. In 1970, Carl Woodring described his book *Politics in English Romantic Poetry* (Cambridge, MA: Harvard University Press, 1970) as in part a response to “the oddity that almost all students of English literature equated romanticism with revolt and that almost all social scientists equated romanticism with conservative reaction” (vii). Woodring’s work, as well as subsequent accounts of the politics of English Romantic poetry by other critics, shifted the disciplinary split that Woodring noted into Romantic literary criticism itself, in the sense that Romantic literary critics often subsequently sought to determine when a given poet shifted his political allegiances from radical to conservative (e.g., Nicholas Roe, *Wordsworth and Coleridge: The Radical Years* [New York: Oxford University Press, 1990]), or whether a poet earlier taken as radical was in fact always a conservative (e.g., James K. Chandler, *Wordsworth’s Second Nature: A Study of the Poetry and Politics* [Chicago: University of Chicago Press, 1984]), or what kinds of text ought properly to be called radical (e.g., Kevin Gilmartin, *Print Politics: The Press and Radical Opposition in Early-Nineteenth-Century England* [Cambridge: Cambridge University Press, 1996]).


24. Ryan contrasts classical liberalism—which includes Locke and Smith but also the twentieth-century economist Friedrich Hayek—with “modern liberalism,” exemplified by authors such as John Stuart Mill and L. T. Hobhouse. Ryan suggests that modern liberals were committed not simply to the premise that each individual ought to determine his or her own best interests but also believed that the individual—and society more generally—should “progress,” which required that the individual be free from “the fear of hunger, unemployment, ill health, and a miserable old age,” and that the individual perpetually seek to improve herself. As Ryan notes, these positions tended to encourage support for a powerful state focused on the welfare of its citizens and hence undercut the position that property is “sacrosanct.” Ryan, *The Making of Modern Liberalism*, 25.

25. My Foucault-inspired approach to liberalism leaves me unconvinced by attempts to distinguish between “political” and “economic” liberalism. As I noted above, Hardin distinguishes in *Liberalism, Constitutionalism, and Democracy* between “political liberalism” (the “core concern” of which is the individual) and “economic liberalism” (which focuses “on the general prosperity of the society, not on individual advantage” [43]). Such an attempt to distinguish between these two modes of liberalism obscures the fact that key “political” liberal theorists such as John Locke and John Stuart Mill were also economic theorists/liberals. More important, this
distinction also overlooks the political implications of the epistemological shift stressed by Foucault, which is common to both Hardin’s political and economic liberalisms, and suggests that, rather than being fully distinct modes of liberalism, political and economic liberalisms instead are simply two different tactics for achieving the same end of limiting sovereign power.


27. In her astute “Response” in the “Romanticism and Biopolitics” Praxis Series special issue of Romantic Circles, Eva Geulen makes a similar point, noting that though “many analyses tend to use the perspective of biopolitics to indict or, at least, challenge the cherished icons of the Romantic tradition,” the “authors collected in this volume are determined to relieve Romanticism from any biopolitical charges and suspicions” (para. 7).


30. Esposito, Bîos, 56.

31. I also find helpful Alexander G. Weheliye’s critique of the color-blindness of several important existing accounts of biopolitics, especially that developed by Agamben; see his Habeas Viscus: Racializing Assemblages, Biopolitics, and Black Feminist Theories of the Human (Durham, NC: Duke University Press, 2014). However, the notable absence of Esposito from Weheliye’s critique encourages my sense that Esposito resolves some of those difficulties in Agamben’s approach to which Weheliye points.


33. Esposito, Bîos, 70.

34. As Esposito stresses in Bîos (70–71), even the supposedly “positive” liberty described by Isaiah Berlin in his famous “Two Concepts of Liberty” essay is a fundamentally negative concept, defined primarily by what one wishes to avoid (in Berlin’s words, “external forces of any kind,” 178).

35. Esposito’s own understanding of the relationship of liberalism and biopolitics is not entirely clear, in part because Bîos and Third Person present significantly different accounts of this relation. In Bîos, Esposito claims that liberalism’s innate “tendency to
intervene legislatively” and its commitment to self-preservation ensured that “liberal individualism” transformed into nationalism in the nineteenth century and into totalitarianism in the twentieth century (76). This minimal (and, to my eyes, not convincing) account of the transformation of liberalism into totalitarianism is rejected in Third Person, in which Esposito contends that “liberalism . . . came out as the real winner in the epochal double battle against Nazism and communism,” and as a consequence, we must not “blur the clear boundary that separates the bio-thanatopolitics of the Nazi State from the individual biopolitics of the liberal type, which represents its clear reversal. While the first is based on an increasingly totalized restriction of freedom, the second is devoted to the progressive expansion of freedom. But it does remain bound to the same imperative, which is to manage life productively: in the first case, to benefit the racial body of the chosen people; and in the second, to benefit the body of the individual subject who becomes its master” (91). This latter understanding of the biopolitical constellation of liberalism is much more convincing and guides my reflections in subsequent chapters.

36. Esposito, Biosk, 12. With that said, Esposito does approach something like a positive claim about immunity and biopolitics in the final chapter of Immunitas, 145–77.


41. The influence of Newton was often explicit, as in David Hume’s approving citation in the Enquiry Concerning the Principles of Morals (London: Printed for
A. Millar, 1751) of “Newton’s second rule of philosophizing”: that is, “where any principle has been found to have great Force and Energy in one Instance, to ascribe to it a like Energy in all similar Instances” (61). For a helpful discussion of the ways that political economists such as Hume and Adam Smith both followed but also departed from Newton’s method, see Leonidas Montes, “Newton’s Real Influence on Adam Smith and Its Context,” *Cambridge Journal of Economics* 32 (2008): 555–76.

42. John Arbuthnot, *Mr. Maitland’s Account of Inoculating the Smallpox Vindicated, from Dr. Wagstaffe’s Misrepresentations of That Practice, with Some Remarks on Mr. Massey’s Sermon* (London: Printed and sold by J. Peele, at Lock’s Head in Paternoster-Row, 1722), 39. I return to these debates about smallpox inoculation in Chapters 1 and 5.

43. Philip Mirowski has documented in *More Heat Than Light: Economics as Social Physics; Physics as Nature’s Economics* (Cambridge: Cambridge University Press, 1989) the ways that late-nineteenth-century economists sought to secure economics as a science by drawing on the theoretical frameworks and equations of physics. These economists argued that though authors such as Hume, Smith, and Malthus had *aspired* to create a real science, they had unfortunately lacked the mathematical skills and tools to do so. In *Machine Dreams: Economics Becomes a Cyborg Science* (Cambridge: Cambridge University Press, 2002) and *Never Let a Serious Crisis Go to Waste*, Mirowski tracks the subsequent (and never resolved) battles of twentieth-century and twenty-first-century economists to present their project as really a “hard” natural science.


9. On population growth figures, see the entirety of Petty, *Another Essay*, as well as *Political Arithmetic*, 97; on the costs of keeping laborers alive, see *Political Arithmetic*, 102.

10. See Foucault’s discussion of the shifting relationship between “population” and “people” in *Security, Territory, Population*, 42–44.

11. Francis Bacon, *The Essays, or Councils, Civil and Moral, of Sir Francis Bacon, Lord Verulam, Viscount St. Albin with a Table of the Colours of Good and Evil, and a Discourse of the Wisdom of the Ancients* (London: Printed for H. Herringman, R. Scot, R. Chiswell, A. Swalle, and R. Bentley, 1696), 38.


17. See Foucault, *Security, Territory, Population*, 35–49; and *The Birth of Biopolitics*, 1–32. My reading of political arithmetic as liberal (in the sense given to that latter term by Foucault) is, I believe, consistent with the account of political arithmetic in *William Petty and the Ambitions of Political Arithmetic*, in which McCormick stresses the importance of Petty’s Baconian ambitions for political arithmetic and his desire to reconfigure the sense of what it meant to govern (168–208).

18. I consider Hume’s, Steuart’s, and Smith’s contributions to political economy at more length in Chapter 7.

Notes to pages 30–32

Press, 1993), esp. 6, 113–29; and Zeynep Tenger and Paul Trolander, “Genius versus Capital: Eighteenth-Century Theories of Genius and Adam Smith’s Wealth of Nations,” MLQ 55 (1994): 169–89. Woodmansee and Rose argue that insofar as mid-eighteenth-century texts on genius located the source of this capacity in an author’s individuality, these accounts buttressed authorial property right claims and thus helped ensure that literary texts would be understood as properly part of the market. Tenger and Trolander stress, by contrast, that where political economists such as Adam Smith located the key to wealth and progress in a market-oriented division of labor, authors such as Sharpe, Gerard, Duff, and Young saw the key to social order and progress in the many forms of genius that nature providentially provided: “What labor and capital were to Adam Smith, genius was to Sharpe, Duff, and Gerard; it made work, wealth, and progress possible” (174). Tenger and Trolander cite Adam Smith’s dismissive comments about genius in The Wealth of Nations as evidence of the competition between these two ways of understanding the source of wealth and progress and suggest that the discourse of genius petered out in the 1770s precisely because political economy had by then won this discursive battle.

20. William Sharpe, A Dissertation upon Genius: Or, an Attempt to Shew, That the Several Instances of Distinction, and Degrees of Superiority in the Human Genius Are Not, Fundamentally, the Result of Nature, but the Effect of Acquisition (London: Printed for C. Bathurst, 1755), 93.


25. Young, Conjectures on Original Composition, 42.


28. Young, Conjectures on Original Composition, 12. “Imitations,” by contrast, “are often a sort of Manufacture wrought up by those Mechanics, Art, and Labour, out of preexistent materials not their own.”


30. Young, Conjectures on Original Composition, 46–47.


34. While both Empson and Guillory stress the *Elegy’s* extensive canonization, surprisingly neither provides documentation to support this claim. However, Catherine Robson provides an extensive documentation of nineteenth- and twentieth-century school use of Gray’s *Elegy* in *Heart Beats: Everyday Life and the Memorized Poem* (Princeton, NJ: Princeton University Press, 2012), 123–90.

35. Guillory, *Cultural Capital*, 120, my emphasis. More specifically, Guillory contends that “the place of the *Elegy* in the world of cultural production is just at the intersection of two opposing forces: the homogenizing forces expressed by the commonplaces and the common language; and the differentiating forces expressed by the nostalgic evocation of the pastoral genre and the valorized withdrawal from the public sphere. . . . This unique place of rest, the place which is the poem, renders no reader illiterate by ‘refinements of subtlety and the dogmatism of learning.’ To every common reader is given the pleasure of the commonplace and the common language, and at the same time, the pleasure of the withdrawal from the (urban) place—the scene of Ambition, Luxury, and Pride—where this language is formed as the product of a specific kind of struggle, the agon of social mobility. The *Elegy* is thus at once peculiarly accessible to a wide reading public at the same time that its narrative reinscribes this access as innate rather than acquired” (120–21; internal quote from Samuel Johnson).

36. I draw the term “surface” from Foucault’s suggestion that the emergence of biopolitics in the eighteenth century depended upon a new understanding of a population as “a set of elements that, on one side, are immersed within the general regime of living beings and that, on another side, offer a surface on which authoritarian, but reflected and calculated transformations can get a hold” (*Security, Territory, Population*, 75). The term “surface” is also indigenous to late-eighteenth- and early-nineteenth-century liberal theory, as is evident in Benjamin Constant’s suggestion that “the conquerors of our day, peoples or princes, wish their empire to present a unified surface [une surface unie] upon which the proud eye of power may travel without meeting any unevenness that could offend or limit its view. The same code of law, the same measures, the same regulations and if they could contrive it gradually, the same language, this is what is proclaimed to be the perfect form of the social organization.” Benjamin Constant, “The Spirit of Conquest and Usurpation and Their Relation to European Civilization [1814],” in *Political Writings* (Cambridge: Cambridge University Press, 1988), 73, trans. modified. Constant, a key early-nineteenth-century French theorist and proponent of liberalism, critiqued the
creation of “unified surfaces” under “conquerors” such as Napoleon because he felt such surfaces destroyed individual differences. However, Foucault’s work suggests that the creation of unified surfaces was also a key liberal means for locating differences and putting these latter to work.

37. W. E. B. Du Bois, “The Talented Tenth,” in Booker T. Washington et al., *The Negro Problem: A Series of Articles by Representative American Negros of Today* (New York: J. Pott & Company, 1903), 33; Virginia Woolf, *A Room of One’s Own* (New York: Harvest, 2005), 48. None of these surfaces are premised on the idea that everyone can become a genius but rather that everyone (or at least many people) must be “tested” for such potential so that those few who have this capacity can be identified. As Gray noted in an August 19, 1748, letter to Thomas Warton, he believed that the proper “alliance” of education and government “must necessarily concur to produce great & useful Men.” Lonsdale et al., *The Poems of Thomas Gray, William Collins, Oliver Goldsmith*, 85.


39. Cleanth Brooks, *The Well Wrought Urn: Studies in the Structure of Poetry* (New York: Harcourt, Brace, Jovanovich, 1975), 116. The secular, redemptive potential of this common body also helps resolve one of the *Elegy*’s other major ambivalences, namely, that the poem’s rural would-be Hampdens, Miltons, and Cromwells are potentially disruptive figures, as prone to “Luxury and Pride” as their urban counterparts. Gray, *An Elegy*, p. 9 (l. 71). Through these figures of expressed but diverted gifts, the poem encourages not only a desire to identify but also to regulate potential genius.


41. On the history of this hospital, see Miller, *The Adoption of Inoculation*, 146–56.

42. Isaac Maddox, *A Sermon Preached before His Grace Charles, Duke of Marlborough, President, the Vice-Presidents and Governors of the Hospital for the Small-Pox, and for Inoculation, at the Parish-Church of St. Andrew Holburn, on Thursday, March 5, 1752* (London: Printed by H. Woodfall, 1753), 11.

43. John Green, *A Sermon Preached before His Grace George, Duke of Marlborough, President, the Vice-Presidents, the Treasurer, &C. Of the Hospitals for the Small-Pox. On Tuesday, April 26, 1763. By the Right Reverend Father-in-God John Lord Bishop of Lincoln* (London: Printed by H. Woodfall, in Paternoster-Row, 1763), 17.

44. Samuel Squire, *A Sermon Preached before His Grace Charles, Duke of Marlborough, President, the Vice-Presidents, the Treasurer, &C. Of the Hospitals for the Small-Pox, on Thursday, March 27, 1760* (London: Printed by H. Woodfall, 1760), 7.


46. Brownlow North, *A Sermon, Preached before His Grace Augustus Henry Duke of Grafton, President, the Vice-Presidents, and Treasurer, &C of the Hospitals for the Small-Pox and Inoculation, on Thursday May, the 6th, 1773, by Brownlow, Lord Bishop of
Lichfield and Coventry, and Published at Their Request (London: Printed by William Woodfall, 1773), 19.

47. Young, *Conjectures on Original Composition*, 14–15.


51. Guillory discusses the topic of genius only in passing and only in connection with literacy; see 364n17.


54. In a note, Godwin suggested that though the production of genius is not currently the work of the preceptor, it might at some future point be (30n).

55. The likelihood that Godwin’s late-eighteenth- and nineteenth-century readers would recall Gray’s *Elegy* here was increased by Godwin’s explicit citation of lines from both Gray’s *Elegy* and “Ode on a Distant Prospect of Eton College” (*The Enquirer*, 207, 70). Godwin’s trilogy of politician, philosopher, and poet also recalled, even if it did not map exactly to, Gray’s trilogy of Hampden, Cromwell, and Milton.

56. Godwin applied this description specifically to classical authors who wrote in Latin, but it seems to function as the ideal to which he hoped other literature would aspire.

57. In *The Enquirer*, Godwin positioned the institution of law as the antithesis of optimized mental thinking—Godwin claimed that law doesn’t “shorte[n] my course” but rather “multiplies my difficulties a thousandfold” (224)—and, hence, a lawyer, as agent of this institution, was an “evil genius” (227).

58. Pointing to Godwin’s claim in *The Enquirer* that “Literature, taken in all its bearings, forms the grand line of demarcation between the human and animal
kingdoms” (31), McLane argues in Romanticism and the Human Sciences that Godwin is part of the ideologically suspect project of “literary anthropology,” which defines the human in terms of the capacity for, and acquisition of, the newly narrowed category of literature (10–42). This critique has the effect of bringing Godwin’s account of literature back into the fold of Guillory’s argument. Though I share McLane’s suspicion of Godwin’s human/animal distinction, The Enquirer seems to me more divided in its aims than it does to McLane, for her critique does not seem able to account for Godwin’s understanding of literature as leading to precisely those kinds of critical accounts exemplified by McLane’s own text.


1. For the source of this chapter’s epigraph, see http://www.zazzle.com/government_an_evil_usurpation_bumper_sticker-128678877475618014.


7. This dynamic is not restricted to literary criticism; for a compelling account of how feminism has, since the 1970s, established its “smartness” by rejecting biology, see Elizabeth Wilson, “Underbelly,” *differences: A Journal of Feminist Cultural Studies* 21, no. 1 (2010): 194–208.

8. For accounts of the continued impact of Shelley’s novel, see George Lewis Levine and U. C. Knoepflmacher, *The Endurance of Frankenstein: Essays on Mary Shelley’s Novel* (Berkeley: University of California Press, 1979); and Susan Tyler Hitchcock, *Frankenstein: A Cultural History* (New York: Norton, 2007). I consider the enduring relevance of this novel at more length in “Frankenstein and the Sciences of Self-Regulation” (forthcoming); see also the other contributions to this special issue of the *Huntington Library Quarterly*.


10. Frances Ferguson, “Malthus, Godwin, Wordsworth, and the Spirit of Solitude,” in *Literature and the Body: Essays on Populations and Persons*, ed. Elaine Scarry (Baltimore, MD: Johns Hopkins University Press, 1988), esp. 106–11. Among Malthus’s contemporaries, Hazlitt made this same point, noting in *A Reply to the Essay on Population* that the “common notions that prevailed on this subject, till [Malthus’s] first population-scheme tended to weaken them, were that life is a blessing, and that the more people could be maintained in any state in a tolerable degree of health, comfort and decency, the better” (44). I return to Hazlitt’s critique of Malthus in Chapter 6.


15. For further discussion of the reasons that I find Foucault’s term “surface” useful, see Chapter 1.


19. The account generally accepted by historians of science is that Darwin arrived at population thinking by combining Malthus’s understanding of a population as a collection of individuals who compete against one another for food with

20. With that said, the historian of science Jacques Roger, in *Buffon: A Life in Natural History*, trans. L. Pearce Williams (Ithaca, NY: Cornell University Press, 1997), suggested that the influential eighteenth-century naturalist Georges-Louis Leclerc, Comte de Buffon ended up with something like Mayr’s model of population thinking. Roger argued that Buffon’s concept of species departed from the typological premise that characterized most other eighteenth-century reflections on species. While Buffon proposed, like many of his contemporaries, a “general prototype of each species on which every individual is modeled,” he stressed that no individual member of a species “is entirely similar to any other individual, or consequently to the model whose imprint it carries.” Buffon, cited in Roger, *Buffon*, 297. Roger contends that this “destroyed all definitions of a species as a collection of absolutely similar beings. It is therefore tempting to see here the origin of the ‘idea of populations’ in the sense used by Ernst Mayr, that is, a conception of the species as a population composed of individuals all differing among themselves” (297). See also John C. Greene, “Aristotle to Darwin: Reflections on Ernst Mayr’s Interpretation in *The Growth of Biological Thought*,” *Journal of the History of Biology* 25, no. 2 (1992): 257–84. Alan Bewell, “Jefferson’s Thermometer: Colonial Biogeographical Constructions of the Climate of America,” in *Romantic Science: The Literary Forms of Natural History*, ed. Noah Heringman (Albany: State University of New York Press, 2008), 111–38, stresses the importance of Buffon’s population approach for eighteenth- and early-nineteenth-century natural history.

21. Romantic-era interest in the transformative potential of anomalies was not restricted to the effects of government intervention; as Denise Gigante has noted in “The Monster in the Rainbow: Keats and the Science of Life,” *PMLA* 117 (2002): 433–48. Romantic-era authors reconceived the very category of “monstrosity” by seeing in it no longer a falling away from proper form but rather a vital excess that was immanent to life and which brought new species and forms of life into being. See also Robert Mitchell, *Experimental Life: Vitalism in Romantic Science and Literature* (Baltimore, MD: Johns Hopkins University Press, 2014), 144–89.


24. I will take up Moretti’s subsequent attempt to consider textual variants from the perspective of evolutionary populations in what follows.


28. This is Moretti’s reading of Frankenstein, for he contends that the novel seeks to reassure its readers that the events it depicts are simply an anomalous “case,” out of keeping with the flow of history; in this way, the novel validates the dominant normative beliefs of early nineteenth-century social relations. Franco Moretti, Signs Taken for Wonders, rev. ed. (New York: Verso, 1988), 89.

29. Though Shelley engaged the topic of population in Frankenstein indirectly via Victor’s reflections on the consequences of reproduction, she engaged the term and concept much more explicitly in her third novel, The Last Man (1826; Peterborough: Broadview, 1996). This novel begins with Lionel Verney’s quasi-political arithmetical reflection that though England is tiny when compared to the rest of the globe, “yet, when balanced in the scale of mental power, [it] far outweighed countries of larger extent and more numerous population” (7). The novel then tracks the effects of a plague that destroys more and more of the global human population, first to the point that the narrator lives “on an earth whose diminished population a child’s arithmetic might number” (306) and then to the point that Verney is literally the last man. This plot provides Shelley with many occasions to discuss epidemic-related population measures and to make more general reflections on populations (in addition to the references cited previously, see esp. 17, 31, 82, 117, 153, 179, 183, 186, 187, 204, 217, 232, 238, 240, 358, 361). Yet Frankenstein, precisely because of its more indirect engagement with the topic of population, allows us to recognize more easily than in The Last Man that claims about populations are always based on models of populations. Or, to put this another way, the plot of The Last Man commits itself to a specific model of population, whereas Frankenstein emphasizes the modeling activity itself that is bound up with claims about populations.


31. Walter Scott, “Remarks on Frankenstein,” Blackwood’s Edinburgh Magazine 2, no. 12 (1818): 613. This review is also available at the website Romantic Circles,

32. A search in the British Periodicals database (http://www.proquest.com/en-US/catalogs/databases/detail/british_periodicals.shtml) for articles that appeared between 1790 and 1822 and contained both the words “novel*” and “species” suggests that it was around 1818 that it became commonplace to refer to (sub)species within the more general species of the “novel.”

33. See, e.g., Scott, “Remarks on Frankenstein,” 614; the anonymous review in Literary Panorama and National Register 8 (1818): 411–41; and (arguably) the anonymous review in Belle Assemblée; or Bell’s Court and Fashionable Magazine 17 (March 1818): 139–42. All of these reviews are available in Romantic Circles, “Mary Wollstonecraft Shelley.”


36. An extreme example of this awareness of the effects of reviews on authorial production was P. B. Shelley’s claim that the reviewers of the Quarterly Review had effectively killed John Keats with bad reviews; see Percy Bysshe Shelley, Shelley’s Adonais: A Critical Edition, ed. Anthony D. Knerr (New York: Columbia University Press, 1984), 5–6.

37. This paragraph is indebted to an unpublished response that Alan Bewell provided at the Pre-Conference on the Romantic Life Sciences for the 2017 North American Society for the Study of Romanticism (NASSR) annual conference. Though Bewell was responding to an early version of Chapter 3 of this book, his stress on the multiple political valences of concepts of population is relevant to many of my chapters, and I have taken up his points here.


40. Richard Price was also a central figure in the development of economically viable life insurance models, a project he pursued in texts such as *Observations on Reversionary Payments; on Schemes for Providing Annuities for Widows, and for Persons in Old Age*, 3rd ed. (London: T. Cadell, 1773). On the importance of Price for the development of the mathematics of probability in the eighteenth century, see Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton, NJ: Princeton University Press, 1993), 179–82.


43. Moretti narrates this story in the headnotes to the essays collected in *Distant Reading*, esp. 1–2, 63–65, 121–22, 37–38. See also *Signs Taken for Wonders*, 262–78; “The Slaughterhouse of Literature”; and *Graphs, Maps, Trees*. Moretti explicitly references Mayr’s accounts of evolution, populations, and speciation in *Graphs, Maps, Trees*, 76, 90; and *Distant Reading*, 148–49, 179.

44. Moretti, *Signs Taken for Wonders*, 265. More specifically, Moretti contended that the process of harsh selection in the nineteenth century was encouraged by “industrial and political convulsions,” which posed for a European readership the problems of “redraw[ing] the territory of individual expectations . . . defin[ing] anew its ‘sense of history,’ and its attitude toward the values of modernity. For all sorts of reasons, the *Bildungsroman* was the symbolic form most apt to solve these problems—the fittest for surviving in the new, selective context. And the *Bildungsroman* did indeed survive, while the *Erziehungsroman* and the *Entwicklungsroman* and the *Künstlerroman*, the allegorical, the lyric, the epistolary and the satirical novel, all perished in that veritable struggle for literary life” (265).
45. In his *Atlas of the European Novel, 1800–1900* (New York: Verso, 1998), Franco Moretti also read markets through the lens of evolution, though in this case much more implicitly, limiting himself to the use of Stephen Jay Gould’s account of the limits on the number of biological species within a habitat (159).


47. In *Graphs, Maps, Trees*, Moretti also used the model of speciation to explain the movement, during the nineteenth century, of the literary device of free indirect discourse from its origin in British literature to the new “geographies” of, for example, French, Russian, and Latin American literature (81–91).

48. Christopher Prendergast, “Evolution and Literary History: A Response to Franco Moretti,” *New Left Review* 34 (2005): 40–62. Moretti responded to many of Prendergast’s points in *Distant Reading*, 137–58. In response to Prendergast’s charge that his method makes it impossible in principle to explain the nature of consumer preferences, Moretti contended that he was simply assuming there an explanation he had provided in earlier texts, namely, “the idea that literary genres are problem-solving devices, which address a contradiction of their environment, offering an imaginary resolution by means of their formal organization. The pleasure provided by that formal organization . . . is the vehicle through which a larger symbolic statement is shaped and assimilated. When readers of detective fiction ‘like’ clues, in other words, it is because the structure provided by clues makes them feel that the world is fully understandable, and rationalization can be reconciled with adventure, and individuality is a great but dangerous thing” (141). However, since Moretti also stressed in his response that he himself had already begun to have doubts about his method when Prendergast’s critique appeared, his responses do not seem intended to salvage any of his method of thinking populations of texts through the lens of evolutionary theory (139).


50. For Moretti’s reflections on his desire to make literary history scientific, see Moretti, *Graphs, Maps, Trees*, 1–2.

51. Alternatively, one could take Mayr’s model of population and speciation much more seriously than does Moretti. New kinds of readers—for example, urban workers, boys, and girls—would then be analogous to those geographic divisions that Mayr stressed in his account of speciation and that enable new populations of novels to emerge. It would probably also make sense to think of novelistic genres not as analogous to a Mayrian *species*—which would mean that they could not “mix” with members of another novelistic species—but rather as analogous with subpopulations of the general species of the novel. This would in turn allow for the possibility, seemingly amply exemplified by the nineteenth-century history of the novel, of crossings and mixings of different genres (e.g., historical gothic novels). This approach would also likely require relating the emergence of new novelistic genres to that process, which began in the late eighteenth century, through which “Literature” was separated from other species of writing (history, philosophy, etc.), and which I discussed at the end of the last chapter.

52. In Chapter 5, I return to this history from the perspective of concepts of “collective experiments.”

54. Or, to put this another way, competition is the most “efficient” means of planning, since it makes the “full[est] use of the existing knowledge” that is possible (521).

55. In the 1980s, Hayek explicitly connected his claims about the wisdom of markets to evolutionary biology and to Mayr specifically; see, for example, his 1983 lecture “Evolution and Spontaneous Order,” https://www.youtube.com/watch?v=yQhqZ-iWMRM; and *The Fatal Conceit: The Errors of Socialism* (Chicago: University of Chicago Press, 1989), 45.


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3. I draw the term “surface” from Foucault’s suggestion that, for eighteenth-century authors, a population was “a set of elements that, on one side, are immersed within the general regime of living beings and that, on another side, offer a surface on which authoritarian, but reflected and calculated transformations can get a hold.” Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France, 1977–78*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2007), 75. For further discussion of the utility of the term “surface,” see Chapter 1.


7. See Foucault, Security, Territory, Population, 30–79.

8. For an account of the actual construction of such data in Britain in the 1720s, largely through the Royal Society and its organ, the journal Philosophical Transactions of the Royal Society, see Genevieve Miller, The Adoption of Inoculation for Smallpox in England and France (Philadelphia: University of Pennsylvania Press, 1957), 100–133, esp. 111–23.


11. Woloch’s focus on adult humans is highlighted by the parallel he draws between George Eliot’s desire in her novels “to preserve a singular protagonist and to extend narrative attention to a broad mass of characters” and what he describes as John Stuart Mill’s “strange compromise position on universal suffrage” (31), according to which Mill wished to grant the right to vote to “every adult human being” but proposed to weight those votes according to the voter’s knowledge (32). “Mill,” Woloch writes, “imagines a franchise that is both stratified and universal: all citizens would receive voting power but to unequal degrees, just as Middlemarch includes many characters, while configuring them in various ways” (31–32). Yet Woloch does not comment at all on Mill’s restriction of voters to adult human beings, nor does he even consider nonhuman agents in the novels that he discusses. While Woloch’s emphasis is valid for a novel such as Middlemarch, since Eliot resolutely restricts her agents to human beings, it does not work for many other nineteenth-century novelists.


14. In Germinal, the hereditary crack is described as “la lésion héréditaire” (1571), while in La bête humaine (The Human Beast), it is described as a “fêlure héréditaire” (La bête humaine, in Les Rougon-Macquart, 1043; ed. and trans. Roger Pearson [Oxford: Oxford University Press, 2009]). Further references to the French originals of Germinal and La bête humaine will be noted parenthetically following the English page numbers. On the nature and role of hereditary cracks in Zola’s work, see Gilles Deleuze’s appendix on “Zola and the Crack-Up” in The Logic of Sense, trans. Mark


19. Frances Ferguson argues that, for the Russian formalists, “agency became such a capacious and formally empty notion that one no longer needed human actors or characters to achieve it; animals and pots and kettles could carry the narrative action as well as a human could. Action, in other words, displaced character, and any sense of characterological depth looked misplaced in an analysis in which both
animals and inanimate objects might play active roles.” Frances Ferguson, “Jane Austen, Emma, and the Impact of Form,” Modern Language Quarterly 61, no. 1 (2000): 158. Ferguson’s larger argument is that Foucauldian-inspired literary criticism has followed the same route of “dispatch[ing] character to the shadows” (158), for “discursive regimes . . . become the pots and kettles of Proppian analysis, the actors that make it clear that activity in no way requires actual persons” (158–59). See also Woloch’s discussion of the antinomy between structuralist and referential approaches to novels in The One vs. the Many, 15–16.

20. Zola, Germinal, 60 [1182], 501–2 [1564], my emphasis.
21. Since Woloch takes for granted that all characters are humans, he does not engage the basic question of how one identifies a novelistic character and from what other novelistic elements a character might be distinguished. Kreilkamp, who is interested in treating animals as minor characters, in Woloch’s sense of that term, engages this question more fully. However, Kreilkamp arguably also begs this question via his claim that “animals in the Victorian period . . . are often treated as semi-human in the realm of culture and as semi-characters in the realm of literature” (82–86). He suggests that this is a consequence of the fact that some animals in novels are given nicknames and something like speech is attributed to them and of the fact that minor human and animal characters both appear and disappear suddenly and without explanation. I agree with this analysis and see these as good reasons to engage animals as characters. Yet it is not clear from this account why names and speech are the minimum criteria for character, nor whether Kreilkamp believes that any novelistic entities that have at least some of these same characteristics (names and attributed speech) should also be understood as characters. For example, the coal mine in Zola’s Germinal is given a name and attributed something like intentionality, but it is not clear to me whether Kreilkamp would therefore understand that entity as a minor character.
22. Woloch, The One vs. the Many, 13.
23. As Kreilkamp astutely notes, a novelist’s decision to name and attribute subjective interiority to nonhuman entities, especially animals, could in some cases determine the genre of the text: “When pets and especially dogs feature as characters in Victorian narratives, those narratives tend to fall into the orbit of one of two minor generic categories, either children’s literature or the anecdote” (83). I am interested here in uses of nonhuman characters that did not relegate novels to these “minor” genres.
24. Zola, La Bête Humaine, 147 [1128].
26. Because I define characters in terms of explicitly attributed agency, I read the coal mine of Germinal as failing to rise to the level of character, for seeming attributions of agency are nearly always qualified as subjective illusions, as the italicized words in the following quotations suggest: “the pit looked to [Etienne] like some monstrous and voracious beast [lui semblait avoir un air mauvais de bête goulue] crouching there ready to gobble everyone up” (Zola, Germinal, 7 [1135], my italics);
the sound of steam hissing is “as though [qui était comme] the monster were congested and fighting for breath” (8 [1136], my italics). By contrast, the narrator directly attributes agency to the mob (la bande/la foule) of striking miners and their families: “And so, out on the open plain that lay white with frost beneath the pale winter sun, the mob [la bande] departed [s’en allait] along the road, spilling out on both sides into the fields of beets” (330 [1417]); “The crowd, easily led, [La foule entraînée], was already turning, even though Étienne protested and begged them not to stop the drainage” (331 [1418]). For the roles of crowds and mobs in nineteenth-century British and French literature, see John Plotz, The Crowd: British Literature and Public Politics (Berkeley: University of California Press, 2007); and Barrows, Distorting Mirrors, respectively.


28. As Woloch beautifully demonstrates in The One vs. the Many, the “realistic” referential dimension of novelistic characters does not prevent these latter from bearing allegorical and symbolic meanings (18–20). To extend Woloch’s analysis, in Germinal, Battle can both refer literally to the use of animal labor in mines and serve as an allegory of the “animalization” of human laborers.


30. Significantly, Latour begins The Pasteurization of France by drawing explicitly and heavily on the account of a battle that Leo Tolstoy developed in his novel War and Peace (3–5).


32. Lukács, “Narrate or Describe?,” 123.

33. Dorrit Cohn, Transparent Minds: Narrative Modes for Presenting Consciousness in Fiction (Princeton, NJ: Princeton University Press, 1978). My approach to free indirect discourse here has more in common with Ann Banfield’s suggestion in Unspeakable Sentences: Narration and Representation in the Language of Fiction (Boston: Routledge & Kegan Paul, 1982) that free indirect discourse often produces “unspeakable sentences,” though I do not adopt Banfield’s structuralist approach. Both Cohn and Banfield refer to “free indirect style,” rather than “free indirect discourse.” For reasons that will become clear in what follows, I stress the discursive, rather than stylistic, dimension of this literary device and so use the term free indirect discourse, which keeps the focus on differences among direct discourse, indirect discourse, and free indirect discourse.


35. This developmental telos established by the narrator’s use of free indirect discourse also helps us understand why Mr. Knightley is, ultimately, the proper object of Emma’s love within the novel, for Mr. Knightley’s style and mode of observations come closest to that of the narrator.
36. I find useful Erich Auerbach’s classic claim in *Mimesis: The Representation of Reality in Western Literature* (Princeton, NJ: Princeton University Press, 1953), 482–86, about the “bitter” emotional atmosphere that pervades a dinner between Emma Bovary and her husband in Flaubert’s *Madame Bovary*. Auerbach stressed that this description is *not* a “representation of the content of Emma’s consciousness, of what she feels as she feels it.” Though Emma “doubtless has such a feeling [of bitterness],” “if she wanted to express it, it would not come out like that; she has neither the intelligence nor the cold candor of self-accounting necessary for such a formulation.” This passage is instead Flaubert’s narrator “bestow[ing] the power of mature expression upon the material which [Emma Bovary] affords. . . . If Emma could do this herself, she would no longer be what she is, she would have outgrown herself and thereby saved herself” (484). Because Auerbach noted that we do not encounter here a “representation of the content of Emma’s consciousness, of what she feels as she feels it,” he then understandably concluded that this should *not* be understood as an instance of “erlebte Rede” (i.e., free indirect discourse) (485). My point, though, is that free indirect discourse *should* be understood in a broader sense, as giving voice to any forces that impinge upon consciousness.

37. Zola, *La Bête Humaine*, 60 [1050].


39. My thanks to Robert Fellman for pointing out that *The Masterpiece* illustrates this point better than does *The Belly of Paris*.

40. For a helpful discussion of the political and judicial institutions against which *The Human Beast* was directed, see Roger Pearson’s introduction to Zola, *La Bête Humaine*, xxiv–xxix.

41. Casey Finch and Peter Bowen, in “‘The Tittle-Tattle of Highbury’: Gossip and the Free Indirect Style in *Emma*,” *Representations* 31 (1990): 1–18, connect Austen’s use of free indirect discourse to something that determines consciousness—namely, ideology—arguing that free indirect discourse channels not the thoughts of individual characters but is rather the novelistic parallel to “gossip.” They connect ideology, gossip, and free indirect discourse by arguing that both gossip and free indirect discourse “function as forms par excellence of surveillance, and both serve ultimately to locate the subject—characterological or political—within a seemingly benign but ultimately coercive narrative or social matrix” (3–4). I briefly return to Finch and Bowen’s approach to free indirect discourse and Frances Ferguson’s critique of this approach briefly in what follows.

42. On Balzac’s use of free indirect discourse, see especially Auerbach’s analysis of *Le Père Goriot* (1834) in *Mimesis*, 468–74. Auerbach makes a compelling case that the collective sentiment, rendered through free indirect discourse, that the boarding-house owner Madame Vauquer should be pitied because she is of that class of “women who have had troubles” and was not treated well by her husband is actually the consequence of Madame Vauquer’s ability to manipulate a “harmony between her person and what we (and Balzac too, occasionally) call her milieu” (470). For George Eliot on the necessity of inferences for civilization, see what are apparently Dorothea’s thoughts about Casaubon (“Here was a man who could understand the higher inward life, and with whom there could be some spiritual communion; nay,
one who could illuminate principle with the widest knowledge: a man whose learning almost amounted to a proof of whatever he believed”), which are followed by the narrator’s claim that “Dorothea’s inferences may seem large; but really life could never have gone on at any period but for this liberal allowance of conclusions, which has facilitated marriage under the difficulties of civilization.” Middlemarch: An Authoritative Text, Backgrounds, Criticism, ed. Bert G. Hornsback (New York: Norton, 2000), 15. On the role of free indirect discourse in this passage, see Violeta Sotirova, “Historical Transformations of Free Indirect Style,” in Stylistics: Prospect & Retrospect, ed. D. L. Hoover and S. Lattig (Amsterdam: Rodopi, 2007), 129–41.


45. For an example of the latter claim, see Franco Moretti’s assertion that “not much happens as long as free indirect style remains confined to Western Europe; at most, we have the gradual, entropic drift from ‘reflective’ to ‘non-reflective’ consciousness: that is to say, from the sharp punctual utterances like those in Mansfield Park, to Flaubert’s all-encompassing moods, where the character’s inner space is unknowingly colonized by the commonplaces of public opinion.” Franco Moretti, Graphis, Maps, Trees: Abstract Models for a Literary History (New York: Verso, 2003), 82.

46. On Balzac’s interest in milieu theory, see Auerbach, Mimesis, 474–82. Flaubert wrote in his December 15–16, 1866, letter to George Sand that he “believe[d] that great Art is scientific and impersonal. What you have to do is to transport yourself, by an intellectual effort, into your Characters—not attract them to yourself.” Flaubert–Sand: The Correspondence, trans. Francis Steegmuller and Barbara Bray (New York: Knopf, 1993), 49. On Eliot’s interest in evolutionary sciences, see Gillian Beer, Darwin’s Plots: Evolutionary Narrative in Darwin, George Eliot, and Nineteenth-Century Fiction (Cambridge: Cambridge University Press, 2009).


48. One can fairly argue that nineteenth-century novels, by creating multiple population models, thereby naturalized the idea of population itself. However, as I discuss more explicitly in the previous chapter, population is an extraordinarily flexible concept and one that is moreover arguably antinormative, since the point of using population concepts is generally to alter some aspect of the population.

49. My thanks to Amanda Jo Goldstein for this suggestion in her response to an earlier version of this chapter.

50. Foucault described this active turn to passivity in volume 1 of The History of Sexuality (New York: Pantheon, 1978), noting that with the rise of biopolitics, “one might say that the ancient right to take life or let live was replaced by a power to foster life or disallow it to the point of death” (138).


9. In addition to characterizing Romantic science and political theory, the operation of untethering also marked key eighteenth-century British transformations of


11. We might see this Romantic-era interest in light as a force that produces its effects orthogonally—that is, at an angle to the direction of the solar rays themselves—as one of the key points of difference between “Romanticism” and “Enlightenment.” As the periodizing term itself suggests, Enlightenment thinkers understood progress as a process that took place in the same plane, or planes, as flows of “light,” and thus those institutions or forces that impeded progress—superstition, a conspiring priesthood, etc.—were simply obstacles that prevented full illumination. For the Romantics, by contrast, progress could never bear this kind of straightforward relationship to the light of reason. From this perspective, Malthus’s original 1798 essay on population appears as an attempt to introduce the principle of orthogonal drag into the Enlightenment schema of William Godwin’s *Of Political Justice*.


15. As Alan Bewell notes in *Wordsworth and the Enlightenment: Nature, Man, and Society in the Experimental Poetry* (New Haven, CT: Yale University Press, 1989), for late-eighteenth-century scientists, “What was happening in America was little short of astonishing: not only had a relatively small number of ill-equipped human beings radically transformed a landscape, but they had also begun to change its climate” (244).


Symbolism in Eighteenth-Century England (Princeton, NJ: Princeton University Press, 1996); for weather observation networks, see Favret, “War in the Air,” 543. Establishing a viable network depended in part on the standardization of instruments, so that observers had some confidence that measurements obtained in one location were commensurable with measurements obtained in another.

20. Janković, Reading the Skies, 156, 158.
22. As Latour notes in Science in Action, this suggests that “knowledge” should not be understood as something “that could be described by itself or by opposition to ignorance or to ‘belief’” but rather can be understood only “by considering a whole cycle of accumulation: how to bring things [e.g., measurements or samples] back to a place for someone to see it for the first time so that others might be sent again to bring other things back” (220).
23. Williams, The Climate of Great Britain, 349. For a brief discussion of Williams’s proposal, see Janković, Reading the Skies, 1, 147.
24. Williams, Climate of Great Britain, 343–44.
25. Desmond King-Hele’s Erasmus Darwin and the Romantic Poets (New York: St. Martin’s, 1986) provides the classic account of Erasmus Darwin, but I draw also on more recent discussions in Alan Bewell, “Erasmus Darwin’s Cosmopolitan Nature,” ELH 76 (2009): 19–48, reprinted in Natures in Translation: Romanticism and Colonial Natural History (Baltimore, MD: Johns Hopkins University Press, 2016), 53–86; and Jackson, “Rhyme and Reason.” See also Siobhan Carroll, “Crusades against Frost: Frankenstein, Polar Ice, and Climate Change in 1818,” European Romantic Review 24, no. 2 (2013): 211–30, which also connects Darwin’s discussions of ice and weather to both Percy Bysshe Shelley’s Queen Mab and Mary Shelley’s Frankenstein and establishes that debates about global terraforming were not limited to poetry but were engaged—often with explicit reference to Darwin’s poetic accounts—in early-nineteenth-century British periodicals, especially in connection with discussions of British government–funded trips to the Arctic. These discussions were encouraged by the 1815 Mount Tambora volcanic explosion, which produced worldwide climatic change, and a “year without summer” in 1816 in Britain and Europe; see both Carroll, “Crusades against Frost,” 215–19; and Gillen D’Arcy Wood, Tambora: The Eruption That Changed the World (Princeton, NJ: Princeton University Press), 2014.
26. Darwin, The Botanic Garden, I: 59–60 (Canto I, ll. 527–31). In this and in subsequent citations from The Botanic Garden, I provide the volume and page number, followed by a parenthetical explanation of the canto number and the specific line numbers of the reference, when the latter is applicable.

30. Percy Bysshe Shelley, *Queen Mab; a Philosophical Poem*, ed. Jonathan Wordsworth (New York: Woodstock, 1990), 75 (Canto VI), 105 (Canto VIII). In this and the following references to *Queen Mab*, I note canto numbers for each citation parenthetically.

31. Even Shelley’s suggestion that the sea could be dotted with convenient islands had some precedent in eighteenth-century science, for Erasmus Darwin had claimed in *The Temple of Nature; or, The Origin of Society: A Poem, with Philosophical Notes* (London: J. Johnson, 1803) that it was probable that “the ocean has decreased in quantity during the short time which human history has existed” and would continue to do so in the future, making it likely that islands could be seeded throughout these shallower seas (24, note to l. 268).

32. I discuss the context of Shelley’s interest in science and technology more fully in Robert Mitchell, “‘Here Is Thy Fitting Temple’: Science, Technology, and Fiction in Shelley’s *Queen Mab*,” *Romanticism on the Net* 21 (2001).


34. Shelley, *Queen Mab*, 233, 232.


38. For Thomas Nagel’s original account of the “view from nowhere,” see *The View from Nowhere* (New York: Oxford University Press, 1986); for a compelling discussion of the history of the concept of “objectivity,” see Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone, 2007). Though I described Shelley’s image as “cosmic” in the earlier version of this argument developed in “Global Flows: Romantic-Era Terraforming,” in *British Romanticism and Early Globalization: Developing the Modern World Picture*, ed. Evan Gottlieb (Lewisburg, PA: Bucknell University Press, 2014), 199–218, my use of Hannah Arendt’s work later in this chapter encouraged me to reconsider how to describe the kind of image that Shelley employs. For Arendt, the consideration of nature from a “cosmic” rather than an earthly standpoint is one of the defining characteristics of the modern sciences, but this standpoint necessarily produces what she describes as earth-alienation. Hannah Arendt, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), 204. While Shelley’s image draws for its veracity on the sciences, it is intended to work against earth-alienation by bringing readers back to the globe on which they live.


41. Barbauld’s image is itself connected to Thomas Wright’s suggestion in An Original Theory or New Hypothesis of the Universe, Founded upon the Laws of Nature, and Solving by Mathematical Principles the General Phenomena of the Visible Creation (London: Printed for the Author, and sold by H. Chapelle, in Grosvenor-Street, 1750) that imagining the complete destruction of some of the millions of inhabitable worlds in the universe, or even “the total Dissolution of a System of Worlds,” is in fact a “cheerful” idea, since it “must convince [us] of [our] Immortality, and reconcile [us] to all those little Difficulties incident to human Nature, without the least Anxiety” (76). My thanks to Dahlia Porter for bringing both the Wright and Barbauld connections to my attention.

42. Chakrabarty stresses the latter dynamic, noting that for nineteenth-century liberals such as John Stuart Mill, “Indians or Africans were not yet civilized enough to rule themselves” but could in principle grow up to the point that they also occupied the present, rather than past, of mankind. Dipesh Chakrabarty, Provincializing Europe: Postcolonial Thought and Historical Difference (Princeton, NJ: Princeton University Press, 2000), 8. Domenico Losurdo, Liberalism: A Counter-History, trans. Gregory Elliott (New York: Verso, 2011), documents the extent to which stadial histories of mankind underwrote liberal defenses of slavery from Locke onward. Writing from a standpoint much more sympathetic to liberalism, the political theorist Ryan also stresses the extent to which liberalism intrinsically aims to encompass the earth; see Alan Ryan, The Making of Modern Liberalism (Princeton, NJ: Princeton University Press, 2012), 107–22.

43. Though the goal of Provincializing Europe is clearly to reform Marxist criticism from within, Chakrabarty nevertheless stresses repeatedly that one should not simply dismiss liberalism (see, for example, 4, 8, 13, 14, 23, 250).


46. The debate between Chakrabarty and Baucom is complicated by the uncertain referent of “extinction” for each. In “The Climate of History: Four Theses,” Critical Inquiry 35, no. 2 (2009): 197–222, Chakrabarty oscillates between claiming that the human species is threatened with extinction and the claim that at stake is “the survival of human life as developed in the Holocene period”; that is, human societies organized around institutions such as agriculture, cities, durable architecture, and
the arts (213; see also Chakrabarty’s stress on the importance of “parametric [that is, boundary] conditions for the existence of institutions central to our idea of modernity and the meanings we derive from them,” 217). Baucom reads Chakrabarty as focused solely on the extinction of the human species (“History 4°,” 140–41). Yet Baucom’s disinclination to advocate for any specific “content” of freedom threatens to render the latter an inherently formal category and confuses the question of whether Baucom is also committed to the survival of institutions such as agriculture, cities, durable architecture, and the arts.

47. As critics of the concept of the Anthropocene have pointed out, though discussions of the Anthropocene begin with acknowledgment of the extraordinary complexity of ecological processes, they nevertheless often lead to desires for a technocratic fix. This latter is exemplified in the conclusion of Crutzen’s seminal article of 2002, in which he argued that a “daunting task lies ahead for scientists and engineers to guide society towards environmentally sustainable management during the era of the Anthropocene. This will require appropriate human behaviour at all scales, and may well involve internationally accepted, large-scale geo-engineering projects, for instance to ‘optimize’ climate” (“Geology of Mankind,” 23). On geo-engineering, see Davies, The Birth of the Anthropocene, 52–56; and Clive Hamilton, Earthmasters: The Dawn of the Age of Climate Engineering (New Haven, CT: Yale University Press, 2013).

48. Shelley’s vision of global transformation also avoids the primitivist or Rousseauvian premise that humans should “return” to some presumably better past state of human relationships with one another and their natural environments. As a consequence, Shelley avoids the “fall from grace” paradigm that characterizes many versions of the Anthropocene, that is, the premise that humans have become a force of global environmental transformation only by transgressing the virtuous limits within which all other plants and animals are contained. For a discussion of this dimension of many versions of the Anthropocene, see Davies, The Birth of the Anthropocene, 7, 25, 108. Dipesh Chakrabarty’s version of the fall is what he describes as “ecological overshoot”: see, e.g., “The Politics of Climate Change Is More Than the Politics of Capitalism,” Theory, Culture, & Society 34, no. 2–3 (2017): 27, 32–34.


50. Shelley stressed in A Defence of Poetry, in Shelley’s Poetry and Prose: A Norton Critical Edition, ed. D. H. Reiman and N. Fraistat (New York: Norton, 1977), that poetry enables redemptive joy: “Poetry thus makes immortal all that is best and most beautiful in the world; it arrests the vanishing apparitions which haunt the interlunations of life, and veiling them, or in language or in form, sends them forth among mankind, bearing sweet news of kindred joy to those with whom their sisters abide—abide, because there is no portal of expression from the caverns of the spirit which they inhabit into the universe of things. Poetry redeems from decay the visitations of the divinity in man” (505).
56. Kim Stanley Robinson's most well-known “emigration—from—earth” novels are *Red Mars* (New York: Bantam, 1993), *Green Mars* (New York: Bantam, 1994), and *Blue Mars* (New York: Bantam, 1994). At one level, the Mars trilogy is a scientifically plausible account of how humans might terraform Mars over the course of several centuries to make it habitable for humans. However, at a more fundamental level, it is the story of the shipping network that links the politics, economics, and ecology of Mars and Earth. Fredric Jameson’s powerful readings of Robinson’s trilogy in *Archaeologies of the Future: The Desire Called Utopia and Other Science Fictions* (New York, Verso, 2005), 393–416, are helpful, though Jameson’s emphasis on the limits of utopian thinking does not encourage him to attend closely to either the question of flows or to fundamental transformations of human beings in Robinson’s series.
58. Though Robinson has the voyage last 160 years because of the plausible maximum speed such a ship could reach, it is no doubt not coincidental that seven generations is also a timeframe that plays an important role in contemporary ecological thinking. See, e.g., Stewart Brand, *Whole Earth Discipline: Why Dense Cities, Nuclear Power, Transgenic Crops, Restored Wildlands, and Geoengineering Are Necessary* (New York: Penguin, 2010), which endorses the “seven generations’ approach to future responsibility long credited to the Iroquois League” (79).
59. For example, phosphorus, which the inhabitants require for farming, has become increasingly scarce, yet it is not clear where the “leak” in the phosphorus cycle might be located. Devi, the ship’s chief engineer, notes that “everyone gets recycled into the system. There’s a lot of phosphorus in our bones that has to be retrieved. In fact I wonder if the missing phosphorus is in people’s cremation ashes! You’re only allowed to keep a pinch, but maybe it’s adding up.” Kim Stanley Robinson, *Aurora* (New York: Orbit, 2015), 102.
61. I discuss further the importance of the category of “moral restraint” for Malthus’s text in Chapter 6.
63. The unnamed narrator of the last part of *Aurora* makes the same point, noting that “the many virtual, simulated, and indoor spaces that so many Terrans seem happy to inhabit” mean that these humans are “in effect occupying spaceships on the land” (469).

65. This closing scene forms a pair with the water scene that opens the novel, which describes Freya’s much more placid childhood sailing trip with her father on a lake inside the spaceship.

66. As Amitav Ghosh notes in *The Great Derangement: Climate Change and the Unthinkable* (Chicago: University of Chicago Press, 2016), “through much of human history, people regarded the ocean with great wariness,” and even those peoples who “made their living from the sea, through fishing or trade, generally did not build large settlements on the water’s edge” but rather situated cities in areas “protected from the open ocean by bays, estuaries, or deltaic river systems” (37). In *The Lure of the Sea: The Discovery of the Seaside in the Western World, 1750–1840* (Cambridge: Polity, 1994), Alain Corbin documents the fairly recent European discovery of the pleasures of seaside beaches. Robinson’s representation of the beach as a site of ecstatic learning, rather than a place for habitation, links up well with this history of human relationships to the sea.


68. This is another way of approaching what Kathryn Yusoff captures, in the title of her book, as the need for *A Billion Black Anthropocenes (or None)* (Minneapolis: University of Minnesota Press, 2018).


70. For further real-world examples, see the Anthropocene ToolKit website: https://cissct.duke.edu/teaching-learning.

71. Brand, *Whole Earth Discipline*.

5. Liberalism and the Concept of the Collective Experiment


4. John Arbuthnot, Mr. Maitland’s Account of Inoculating the Smallpox Vindicated, from Dr. Wagstaffe’s Misrepresentations of That Practice, with Some Remarks on Mr. Massey’s Sermon (London: Printed and sold by J. Peele, at Lock’s Head in Paternoster-Row, 1722), 2.


6. Arbuthnot cites Mather’s use of the term “experiment” (36) and reproduces Mather’s March 10, 1721/1722, “Letter from Boston in New England” (58–61). He also cites Nettleton’s reference to smallpox inoculation as an experiment (56) and reproduces Nettleton’s “A Letter from Dr. Nettleton, at Halifax in Yorkshire, to Dr. Jurin, R. S. Secretary” (54–58).

7. Arbuthnot contended that “if the Doctor’s Aphorism, laid down . . . That an Experiment, to make it useful, always must be nearly uniform; there must be no such Thing as the Practice of Physick; unless by the Word nearly he allows a very great Latitude” (14).

8. See Chapter 2 for more on political arithmetic.

9. Arbuthnot also suggests that “the same Odds wou’d be a sufficient prudential Motive to any private Person to proceed upon, abstracting from the more occult and abstruse Causes which seem to favour this Operation” (21).

10. Arbuthnot was relatively uninterested in why individuals might make different decisions about whether to be inoculated. He implied that differing judgments were based on differing assessments of the “Odds” (i.e., probability) of the success of smallpox inoculation in preventing this disease. However, since he also claimed that the ratios he provided in his text would convince any rational person to be inoculated—“the same Odds wou’d be a sufficient prudential Motive to any private Person to proceed upon” (21)—he implied that equivalently rational thinkers would make the same decisions. Arbuthnot here exemplified a wider tendency of eighteenth-century authors interested in probability to assume that all rational thinkers would, when presented with the same evidence, draw the same conclusions; see Lorraine Daston, Classical Probability in the Enlightenment (Princeton, NJ: Princeton University Press, 1995), 49–58.

11. On the construction of what Rusnock calls a “correspondence network” in the early eighteenth century for disseminating information about smallpox inoculation, see Vital Accounts, 55–70.

12. John Green, A Sermon Preached before His Grace George, Duke of Marlborough, President, the Vice-Presidents, the Treasurer, &C. Of the Hospitals for the Small-Pox. On

13. As I document in Chapter 1, Green’s stress on the link between smallpox inoculation and stable commerce was commonplace in the series of yearly sermons that commemorated the founding of the smallpox hospital.

14. For Arbuthnot’s references to Newgate, see Mr. Maitland’s Account, 23–25. On the importance of Newgate prison tests for the British inoculation effort, see Miller, The Adoption of Inoculation, 80–91; and Rusnock, Vital Accounts, 30. Colonial slaves were also among the early test subjects, which further complicates the question of rights and choice; Miller, The Adoption of Inoculation, 93, 125, 164.

15. Miller, The Adoption of Inoculation, 23, 267–76, argues that the fact that the British aristocracy was much more supportive of smallpox inoculation efforts than the French aristocracy was a key reason for the early adoption of smallpox inoculation in Britain and its much later adoption in France.

16. On Burke as a conservative, see Isaac Kramnick, The Rage of Edmund Burke: Portrait of an Ambivalent Conservative (New York: Basic Books, 1977); and Daniel I. O’Neill, Edmund Burke and the Conservative Logic of Empire (Oakland: University of California Press, 2016); on Burke as a liberal, see J. G. A. Pocock, “The Political Economy of Burke’s Analysis of the French Revolution,” in Virtue, Commerce, and History: Essays on Political Thought and History, Chiefly in the Eighteenth Century (Cambridge: Cambridge University Press, 1985), 193–212; Yuval Levin, The Great Debate: Edmund Burke, Thomas Paine, and the Birth of Right and Left (New York: Basic Books, 2014); and Domenico Losurdo, Liberalism: A Counter-History, trans. Gregory Elliott (New York: Verso, 2011). As O’Neill points out, readings of Burke as a liberal generally focus on his support for the American colonists and on his strictures against government overreach, while readings of him as a conservative tend to focus on his claims in Reflections on the Revolution in France for the importance of tradition and stable social hierarchies (8). Yet most of these readings of Burke as primarily a liberal or conservative nevertheless also stress the difficulty of applying these categories disjunctively. For Kramnick, for example, Burke is an “ambivalent conservative,” while for Levin, he is a “conservative liberal.” From the perspective that I develop in this chapter, Losurdo provides the most useful approach to the question of Burke’s political allegiances, for he clarifies that liberalism has always presumed a hierarchical division between the small number of those who are worthy of freedom (and who must thus be protected from government overreach) and the much greater number of uncivilized humans who are not worthy of freedom (and who must be under direct and often violent government control).


18. Burke did not dispute the existence of “rights of men” but argued that they should never be considered abstractly: “These metaphysic rights entering into common life, like rays of light which pierce into a dense medium, are, by the laws of nature, refracted from their strait line. Indeed, in the gross and complicated mass of human passions and concerns, the primitive rights of men undergo such a variety of
refractions and reflections, that it becomes absurd to talk of them as if they continued in the simplicity of their original direction” (Reflections, 90–91). For an acute analysis of Burke’s account of the rights of man, see James K. Chandler, Wordsworth’s Second Nature: A Study of the Poetry and Politics (Chicago: University of Chicago Press, 1984), 32–35.

19. Though my focus is different than Pocock’s, my argument resonates with his claim in “The Political Economy of Burke’s Analysis of the French Revolution” that though Burke, like Hume and Smith, promoted a liberal, Whig order of commercial relations, Burke saw the latter as dependent upon a more primary foundation of “manners.”

20. This is highlighted by the importance of Burke for nineteenth-century liberals; see Losurdo, Liberalism: A Counter-History, 37–38, 54, 59, 62–63, 130–33.

21. Or, as Mill put it on the first page of his text (On Liberty, 217), he sought to establish “the nature and limits of the power which can be legitimately exercised by society over the individual.”

22. Mill was equally concerned with legal constraints and the stultifying effects of “opinion,” contending “protection . . . against the tyranny of the magistrate is not enough: there needs protection also against the tyranny of the prevailing opinion and feeling; against the tendency of society to impose, by other means than civil penalties, its own ideas and practices as rules of conduct on those who dissent from them; to fetter the development, and, if possible, prevent the formation, of any individuality not in harmony with its ways, and compel all characters to fashion themselves upon the model of its own. There is a limit to the legitimate interference of collective opinion with individual independence: and to find that limit, and maintain it against encroachment, is as indispensable to a good condition of human affairs, as protection against political despotism.” On Liberty, 219–20.

23. Though Mill did not explain his choice of the word “experiment” in On Liberty, he could have been certain, given his important earlier work on the philosophy of science in A System of Logic (1843), that contemporary readers would have understood his use of the term as having a quasi-scientific sense. On Mill’s debate with William Whewell over the nature of the scientific method and the progress of science, see Laura J. Snyder, Reforming Philosophy: A Victorian Debate on Science and Society (Chicago: University of Chicago Press, 2006).

24. Or, as Mill wrote in On Liberty, “A person whose desires and impulses are his own—are the expression of his own nature, as it has been developed and modified by his own culture—is said to have a character” (264). For reflections on the relationship between liberalism and Mill’s concept of character, see Elaine Hadley, Living Liberalism: Practical Citizenship in Mid-Victorian Britain (Chicago: University of Chicago Press, 2010), 70–106.


26. Mill (On Liberty, 224) stressed that he foregoes “any advantage which could be derived to my argument from the idea of abstract right, as a thing independent of utility. I regard utility as the ultimate appeal on all ethical questions; but it must be utility in the largest sense, grounded on the permanent interests of man as a progressive being.”
27. As a professed utilitarian, Mill held that progress resulted when collective happiness increased. However, that answer raises the question of what enabled happiness to increase, and the answer to that latter question seems to have been an increase in knowledge and individuality.

28. Mill thus lamented the fact that, in the past, it has more often been the case that “one partial and incomplete truth” has “substitute[d] . . . for another,” with “improvement” then being limited to the fact that “the new fragment of truth is more wanted, more adapted to the needs of the time, than that which it displaces.” *On Liberty*, 252–53.

29. Mill, *On Liberty*, 215; see Wilhelm von Humboldt, *The Limits of State Action* (Indianapolis, IN: Liberty Fund, 1993), 48. Mill referred to this text as *Sphere and Duties of Government*. Though Humboldt composed *Ideen zu einem Versuch die Grenzen der Wirksamkeit des Staats zu bestimmen* (Ideas toward an attempt to determine the limits of the activity of the state) in 1791–1792, only short parts of the text were published in 1792 in the *Berlinerische Monatsschrift*, and the text as a whole did not appear before Humboldt’s death in 1835. The full version of the text first appeared in the 1852 German collected works of Humboldt and was translated into English in 1854, and this latter was the text that Mill consulted. For accounts of the composition and publishing history of Humboldt’s text, see J. W. Burrow’s introduction to Humboldt, *The Limits of State Action*, xvii–lviii; and David Sorkin, “Wilhelm von Humboldt: The Theory and Practice of Self-Formation (Bildung), 1791–1810,” *Journal of the History of Ideas* 44, no. 1 (1983): 55–73.

30. Mill, *On Liberty*, 261; Mill’s quotations are drawn from Chapter II (“Of the individual man, and the highest ends of his existence”) of Humboldt’s *The Limits of State Action* (10, 12).


32. On the importance of both Leibniz and Pietism for Humboldt, see Ernst Lichtenstein, *Zur Entwicklung des Bildungsbegriffs von Meister Eckhart bis Hegel* (Heidelberg: Quelle & Meyer, 1966), 22–25; Sorkin, “Wilhelm von Humboldt,” 59–68; and Paul R. Sweet, “Young Wilhelm von Humboldt’s Writings (1789–93) Reconsidered,” *Journal of the History of Ideas* 34, no. 3 (1973): 471. In *The German Tradition of Self-Cultivation: “Bildung” from Humboldt to Thomas Mann* (London: Cambridge University Press, 1975), Walter Horace Bruford also stresses the importance of the Stoic ideal of self-sufficiency for Humboldt (1, 14). While Humboldt’s interest in Leibniz and the Stoics encouraged his interest in self-development (Bildung), neither source explains Humboldt’s equal emphasis on the need to pursue Bildung through engagement with others. As Sorkin puts it, for Humboldt “self-formation . . . requires social bonds,” yet both Leibniz’s monadology and Stoicism rejected precisely these kinds of bonds (59). For Leibniz, monads are “windowless” (the “Monads have no windows through which anything can come in or go out”), and so each monad strove toward its perfection or entelechy alone, with any apparent coordination and cooperation among monads the consequence of a harmony among monads preestablished by God. Gottfried Wilhelm Leibniz, “Monadology,”
trans. George Montgomery, in *Discourse on Metaphysics; Correspondence with Arnauld; Monadology* (La Salle, IL: Open Court, 1902), 252, 262. For the Stoics, the goal of self-sufficiency required that social bonds be eliminated as much as possible. Humboldt’s emphasis on the necessity of social bonds for self-formation is thus better explained through his uptake of the Pietist vision that I explain in what follows.


35. Mill’s invocation of the language of genius here is in tension with his rejection, in other texts, of any kind of innate, unalterable differences among individuals. He contended in “Utility of Religion” (1874), for example, that “the power of education is almost boundless: there is not one natural inclination which is not strong enough to coerce, and if needful, to destroy by disuse.” John Stuart Mill, “Utility of Religion,” in *Collected Works of John Stuart Mill*, ed. John M. Robson (Toronto: University of Toronto Press, 1963–1991), 10:409. Mill was in this text a typical political economist, and his “views especially echo those of Adam Smith,” who had argued in *The Wealth of Nations* that “differences in talent” were not innate but the result of the division of labor. Diane B. Paul and Benjamin Day, “John Stuart Mill, Innate Differences, and the Regulation of Reproduction,” *Studies in History and Philosophy of Biological and Biomedical Sciences* 39 (2008): 223. For Smith’s original articulation of this claim, see Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. R. H. Campbell and A. S. Skinner (Indianapolis, IN: Liberty Fund, 1981), 1:28. From this perspective, diversity among individuals was a consequence of the necessary difference in circumstances among individuals; that is, “the real effective education of a people is given them by the circumstances by which they are surrounded”: John Stuart Mill, “The Condition of Ireland [20],” in *Collected Works of John Stuart Mill*, ed. John M. Robson (Toronto: University of Toronto Press, 1963–1991), 24:955. Hayek adopts and makes central to his theory of knowledge the nearly identical claim that individual diversity is a consequence of the physical separation of individuals from one another.

36. While both Hayek and von Mises originally argued this claim in articles intended for other economists, Hayek also made it the centerpiece of his manifesto-like defense of liberalism, *The Road to Serfdom*, which became a rallying point for neoliberals throughout the twentieth century.


39. That is, competition is the most “efficient” means of planning, since it makes the “fullest use of the existing knowledge.” Hayek, “The Use of Knowledge in Society,” 521.
40. Hayek made essentially the same claim in *The Road to Serfdom*, 95.
41. As I noted in Chapter 2, Hayek explicitly connected his claims about the wisdom of markets to evolutionary biology and to Ernst Mayr in the 1980s.
42. In *The Road to Serfdom*, Hayek’s ambivalent neo-Burkean description of the market—it was a tradition, the essence of which must be respected but could also be consciously optimized—led to an equally ambivalent neo-Burkean concept of experimentation. Hayek tended to align “experimentation” with government planning and suggested that this led to totalitarianism. See *The Road to Serfdom*, 45, 51, 14, 196. Yet as I have noted, Hayek also presented the market as itself the product of something like Burke’s mode of unconscious, collective, long-term experimentation.
44. Winch astutely describes neoliberalism as “the belief that an harmonious relationship can be established between Smithian economic liberalism and Burkean conservatism,” in the sense that, “by combining the two positions one arrives at a spontaneous economic order that is the unintended outcome of individual choices, and a legal and governmental regime that respects custom and tradition while being protective of those ‘little platoons’—the family, the Church, and other voluntary associations—that are thought to be essential to social cohesion and even national,” and points to Hayek as “the most influential exponent of this view.” Donald Winch, *Riches and Poverty: An Intellectual History of Political Economy in Britain, 1750–1834* (Cambridge: Cambridge University Press, 1996), 11, 12n23. Though I agree with both this description of neoliberalism and the importance of Hayek, my account seeks to explain how Hayek, by taking seriously the importance of the role of information for the concept of collective experimentation, entwined the Smithian and Burkean positions in a way that was not simply arbitrary or contradictory.
46. In the introduction to *The Road to Serfdom*, Hayek argued against the belief that German intellectual history was intrinsically antiliberal and oriented toward the sort of authoritarian state exemplified by National Socialism. Such a position “overlooks the fact that, when eighty years ago John Stuart Mill was writing his great essay *On Liberty*, he drew his inspiration, more than from any other men, from two Germans—Goethe and Wilhelm von Humboldt” (61). Hayek proposed that the German authoritarian vision first emerged in philosophers such as Fichte (182–83), which suggests that Hayek’s neoliberalism should be understood as an attempt to reclaim a “liberal” mode of German Romanticism or, at least, German late-eighteenth-century philosophy. For a contrary reading, in which Humboldt and Fichte are both part of the German liberal tradition, which latter is opposed to German Romanticism proper, see Frederick C. Beiser, *Enlightenment, Revolution, and Romanticism: The Genesis of Modern German Political Thought, 1790–1800* (Cambridge, MA: Harvard University Press, 1992).
49. Foucault captured this aspect in his suggestion that neoliberalism demands that each individual become an “entrepreneur of himself” (*The Birth of Biopolitics:*)

50. Even if Mill’s stress on the rarity of genius underscored aspects of individuality that were not the result of conscious choice, his concept of the genius nevertheless presumed that an individual chose to work hard to express his or her innate endowments.

51. See, for example, Mitchell and Waldby, “National Biobanks,” and Mitchell, “US Biobanking Strategies.”


53. In subsequent work, Beck addressed the fact that risks are often inequitably distributed, though he reiterated the necessarily global dimension of modern risks; see Ulrich Beck, World at Risk, trans. Ciaran Cronin (Malden, MA: Polity, 2009), 160–86.

54. See Lasagna, “Consensus among Experts.” This emphasis on disunity among experts was also stressed by Arbuthnot.

55. Beck stressed that risk determinations function in this way not when groups oppose science but rather when they link science to their own values and aspirations: “Risk consciousness is neither a traditional nor a lay person’s consciousness, but is essentially determined by and oriented toward science. For, in order to recognize risks at all and make them the reference point of one’s own thought and action, it is necessary on principle that invisible causality relationships between objectively, temporally, and spatially very divergent conditions, as well as more or less speculative projections, be believed, that they be immunized against the objections that are always possible. . . . One no longer ascends merely from personal experience to general judgments, but rather general knowledge devoid of personal experience becomes the central determinant of personal experience.” Risk Society, 72.

57. To put this another way, what remains unclear in Beck’s account is whether the final values established by communities must ultimately be subordinated to scientific knowledge, such as research about global warming. Though Beck addressed this point in *World Risk Society*, his advocacy of what he describes there alternately as “reflexive realism” and “realist constructivism” (88–89) does not solve the problem. However, insofar as Beck suggested that it “requires crass ignorance or decidedly selective vision to overlook the link between an ominously rising temperature curve and increasing greenhouse gas emissions” (92), he seemed to assume that ultimate values about how a group wishes to live must be subordinated to climate science research. My thanks to Jamie Lorimer for discussion about this point.

58. *The Road to Serfdom* was Hayek’s most influential effort to prove that failure to hew narrowly to liberalism led to National Socialist– or Stalinist-style totalitarianism. Foucault discussed National Socialism briefly in *The History of Sexuality* (New York: Pantheon, 1978), 149–50, and noted the obsessive neoliberal focus on totalitarianism in *The Birth of Biopolitics*, 101–21.


62. Arbuthnot, *Mr. Maitland’s Account*, 35. While Arbuthnot’s text implies that in cases of Pestilence, the state compels individuals to act in ways that facilitate the survival of most members of the population, the state could presumably also legitimately choose other criteria, such as ensuring the survival of the “most valuable” members of the population. In *Third Person: Politics of Life and Philosophy of the Impersonal*, trans. Zakiya Hanafi (Malden: Polity, 2012), Roberto Esposito—building on Foucault’s brief account of the intersection of race and biopolitics in *The History of Sexuality*—tracks the emergence of precisely this kind of racial hygienic logic in nineteenth-century European biology, philosophy, anthropology, and linguistics (20–59).


64. Or, as Beck puts it in *Risk Society*, “acceptable values [for contaminants] make possible a permanent ration of collective standardized poisoning,” and in this sense, one is “no longer concerned with questions of ethics at all but with how far one of the most minimal rules of social life—not to poison each other—may be violated” (65).

65. On neoliberalism as a constructivism rather than a naturalism, see Mirowski, *Never Let a Serious Crisis Go to Waste*, 53–57.

66. On this link between the concepts of experience and experiment, see the entry on “Experience” in Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, rev. ed. (New York: Oxford University Press, 2015), 126–29. I also discuss the relationship between these terms in Robert Mitchell, *Experimental Life: Vitalism...*
in Romantic Science and Literature (Baltimore, MD: Johns Hopkins University Press, 2014).


6. Life, Self-Regulation, and the Liberal Imagination


8. René Descartes, *The Philosophical Writings of Descartes*, trans. John Cottingham, Robert Stoothoff, and Dugald Murdoch (Cambridge: Cambridge University Press, 1984), 1:77–78. John Harris’s *Lexicon Technicum: or, an universal English dictionary of arts and sciences: explaining not only the terms of art, but the arts themselves* (London: Printed for Dan. Brown et al., 1708) defines a regulator as “a small Spring belonging to the Ballance in the new Pocket-Watches” (vol. 1, s.v. “Regulator”), while the entry for “Regulator” in Ephraim Chambers’s *Cyclopaedia: Or, an Universal Dictionary of Arts and Sciences* (London: Rivington et al., 1778) notes that for a time-keeping device, this is “a small SPRING belonging to the balance, serving to adjust the going, and to make it go either faster or slower.”


11. The term “regulating” often appeared in seventeenth-century legal proclamations, as the following examples, chosen randomly from Early English Books Online, underscore: *By the King, a proclamation for the better regulating lotteries within the kingdoms of Great Britain and Ireland* (1665); *By the King, a proclamation for regulating the colours to be worn on merchant ships* (1683); and *An act for the better regulating of measures in and throughout this kingdom* (1695).


13. The link between divine action and political sovereignty was explicit. Clarke claimed that if Leibniz’s God had no need to intervene in the universe once he had created it, this was “merely a nominal kingdom . . . wherein all things would continually go on without [the king’s] government or interposition.” Clarke, Leibniz, and Newton, *The Leibniz-Clarke Correspondence*, 14. Leibniz responded that this was equivalent to saying that “a king, who should originally have taken care to have his
subjects so well educated, and should, by his care in providing for their substance, preserve them so well in their fitness for their several stations . . . as that he should have no occasion ever to be amending any thing amongst them; would be only a nominal king” (19–20). For helpful discussion of this debate in the context of the history of the concept of biological regulation, see Canguilhem, *Ideology and Rationality*, 83–87.

14. Canguilhem (*Ideology and Rationality*, 84) argued that Leibniz’s image of divine regulation drew on the image of automatic adjustment provided by Christiaan Huygens’s new watch regulator, while Clarke opposed this notion of automatic adjustment. McLaughlin proposes that Leibniz’s and Clarke’s opposed understandings of divine regulation map more precisely to the difference between a hand-held watch regulator, which operated automatically, and the “governor” of a building-mounted clock (i.e., a human being who at least once a day adjusted the clock). As McLaughlin notes, for seventeenth-century authors, clocks (as opposed to watches) were often not models for precision but rather of created objects that required constant supervision. Peter McLaughlin, “Regulation, Assimilation, and Life: Kant, Canguilhem, and Beyond,” 2007, http://www.philosophie.uni-hd.de/md/philsem/personal/mcl_regulation.pdf, 3–5.


17. Because of Canguilhem’s focus in *Ideology and Rationality* on the prehistory of the physiological concept of regulation, this second model of regulation is absent from his account. Though, given Canguilhem’s focus, this is understandable, it means that his emphasis on eighteenth-century concepts of regulation as committed to the premise of “conservation or restoration of a closed system” (87) is true of physics and physiology but not more generally true of all eighteenth-century approaches to regulation.

18. Though Alessia Pannese focuses on the mid-eighteenth to late nineteenth century and does not consider the authors on which I focus here, her reflections in “The Non-Orientability of the Mechanical in Thomas Carlyle’s Early Essays,” *Journal of Interdisciplinary History of Ideas* 6, no. 11 (2017): 3:1–3:19, on relationships among machines, mechanical causality, automatic behavior, and the will is helpful for parsing out different ways that authors in these periods understood the relationship of automatic behavior to willing. Pannese stresses that some eighteenth-century authors understood “automatism” as a virtuous accomplishment that resulted from the earlier exercise of the will. Pannese notes that David Hartley, for example, stressed in *Observations on Man* (1749) that the child’s willed effort to walk eventually resulted in automatic walking (3:8–10).

19. I employ here the formulation “he or she” in order to capture the fact that Locke includes some women—namely, widows—as market participants, at least in *Some Considerations* (212, 219).
20. This then leads to the tricky—and unanswerable—question of whether freedom should be understood as an attribute of individuals or of the market. In Some Considerations, freedom is attributed to the market, rather than to individuals—for example, the “free” value of gold or silver is equivalent to its “Market value” (325, 327). In Locke’s discourses on government, freedom is an attribute of individuals, both in the sense that the natural state of humans (i.e., the “state [that] all men are naturally in”) is “a state of perfect freedom to order their actions and dispose of their possessions and persons, as they think fit, within the bounds of the law of nature,” while the “freedom of men under government is, to have a standing rule to live by, common to every one of the society, and made by the legislative power erected in it; a liberty to follow my own will in all things, where the rule prescribes not; and not to be subject to the inconstant, uncertain, unknown, arbitrary will of another man.” John Locke, Two Treatises of Government: And a Letter Concerning Toleration (New Haven, CT: Yale University Press, 2003), 101, 110. While markets are instances of “freedom of men under government,” Locke links individual differences, freedom, and markets in a way that makes it impossible to assign freedom either solely to individuals or to markets; rather, freedom is for Locke what emerges when individual differences are bound to markets.

21. James Steuart, An Inquiry into the Principles of Political Economy: Being an Essay on the Science of Domestic Policy in Free Nations (London: Printed for A. Millar and T. Cadell, 1767), 1:24. Keith Tribe—and, following Tribe, Taylor—have argued that Steuart could not understand the economy as self-regulating because “the Sovereign or Statesman is essential in the structure” of Steuart’s account, in the sense that the Sovereign or Statesman “is the sole expression of a unity which is otherwise dispersed among individual units or the categories which articulate those units.” Keith Tribe, Genealogies of Capitalism (Atlantic Highlands, NJ: Humanities Press, 1981), 48; see also his Land, Labour, and Economic Discourse (London: Routledge & Kegan Paul, 1978), 80–109. Taylor helpfully glosses Tribe’s claim: “For Steuart, the statesman’s attention is necessary because economic relations lack an autonomous logic by which they would regulate themselves.” Christopher Taylor, Empire of Neglect: The West Indies in the Wake of British Liberalism (Durham, NC: Duke University Press, 2018), 41. By contrast, Taylor contends, Adam Smith subscribes to the view of self-regulating economic processes. While I acknowledge significant differences between Steuart and Smith, neither Tribe nor Taylor account for Steuart’s claim that his Sovereign/Statesman is a fictional perspective that each reader of the text is supposed to take on. Hence, Steuart writes that though his book “seems addressed to a statesman, the real object of the inquiry is to influence the spirit of those whom he governs” (1:xiv; see also 3–4). In other words, if each member of the polity acts as though a statesman/sovereign organizes economic affairs, this will result in a state of economic affairs that looks as though it had been organized by such a figure. Though Steuart’s is not an especially complex account of self-regulation, it is nevertheless not an account that requires an actual sovereign.

arguing in *The Wealth of Nations* that improvements in the process of production were possible only because the division of labor focused an individual’s attention on one part of the production process; i.e., “Men are much more likely to discover easier and readier methods of attaining any object, when the whole attention of their minds is directed towards that single object, than when it is dissipated among a great variety of things” ([I:1.8](#)). The differences in individual perspective upon which Smith focused here were not innate but instead a function of the position of individuals within a market and within a production process.

23. In *On the Principles of Political Economy, and Taxation*, 3rd ed. (London: John Murray, 1821), for example, David Ricardo defined the “principal problem in Political Economy” as that of “determin[ing] the laws which regulate” the distribution of “the produce of the earth” among the three “classes” of land-owners, owners of capital, and laborers (v).

24. Some mid-eighteenth-century authors explicitly connected “the standard of taste” to questions of political economy and population. In *An Inquiry into the Principles of Political Economy*, for example, Steuart contended that the standard of taste was essential in enabling an increase of total population. “It is not,” Steuart wrote, “in the most fruitful countries of the world, nor in those which are the best calculated for nourishing great multitudes, that we find the most inhabitants. It is in climates less favoured by nature, and where the soil only produces to those who labour, and in proportion to the industry of everyone, where we may expect to find great multitudes; and even these will be found greater or less, in proportion as the turn of the inhabitants is directed to ingenuity and industry.” That is, population and trade increase in those countries in which there are more “useful manufactures, which, being refined by the ingenious, will determine what is called the standard of taste; this taste will increase consumption, which will again multiply workmen, and these will encourage the production of food for their nourishment” (1:35).


Malthus, *An Essay on the Principle of Population: Or a View of Its Past and Present Effects on Human Happiness, with an Inquiry into Our Prospects Respecting the Future Removal or Mitigation of the Evils Which It Occasions*, ed. Donald Winch and Patricia James (Cambridge: Cambridge University Press, 1992), noting this parenthetically as “1992.” However, Winch and James’s edition, based on the 1803 edition of Malthus’s text, does not appear to include several passages from the 1798 edition that were deleted in later editions. When citing these passages, I cite directly from Thomas Malthus, *An Essay on the Principle of Population, as It Affects the Future Improvement of Society, With Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers* (London: J. Johnson, 1798), noted parenthetically as “1798.”


32. See, e.g., Malthus’s claim in the 1798 edition that when population increases, “the number of labourers ... being above the proportion of the work in the market, the price of labour must tend toward a decrease; while the price of provisions would at the same time tend to rise” (1798: 30; 1992: 25).


34. Malthus uses “regulation” as a synonym for political measures when he refers to “tyrannical regulations” (1798: 134) and as a synonym for natural processes when he claims that “population bears a regular proportion to the food that the earth is made to produce” (1798: 55). Malthus employs both senses of the term in his critique of Godwin’s future ideal society, arguing that where Godwin attributes misery to “political regulations” (1798: 176), misery is actually a consequence of “laws inherent in the nature of man” that are “absolutely independent of all human regulation” (1798: 191).


36. As Winch notes, Malthus in fact introduced the category of moral restraint in 1803; see 1992: xiii.


39. Esposito, *Bios*, 52–53. Esposito claims that immunity is the key to understanding the connection between biopolitics and modernity, for “only when biopolitics is linked to the immunitary dynamic of the negative protection of life does biopolitics reveal its specifically modern genesis” (9).


43. Kant, *CPR* 450 (A509; B537).


46. For Malthus’s invocations of pressure, see 1992: 113, 116, 133, 164.


50. Arendt, *Lectures on Kant’s Political Philosophy*, 27.

52. See especially CJ 55–64 (Ak. 212–19).
53. The following paragraphs owe much to Arendt’s stress on the social dimension of thinking in Kant in Lectures on Kant’s Political Philosophy (esp. 40–41) and Zerilli’s compelling extension, in Feminism and the Abyss of Freedom and A Democratic Theory of Judgment, of Arendt’s approach to Kant.
54. The principle of purposiveness can also be described as “the principle of nature’s being commensurate with our cognitive power” (CJ 28 [Ak. 188]).
55. Or, as Kant put it, “the basis of this pleasure is found in the universal, though subjective, condition of reflective judgments, namely, the purposive harmony of an object (whether a product of nature or of art) with the mutual relation of the cognitive powers (imagination and understanding) that are required for every empirical cognition” (CJ 31 [Ak. 191]).
56. See Gilles Deleuze’s discussion in “The Idea of Genesis in Kant’s Esthetics,” in Desert Islands and Other Texts, 1953–1974 (Cambridge, MA: Semiotext(e), 2004), 56–71, of the “free indeterminate agreement” among the faculties in judgments of taste. Vivasvan Soni, “Playing at Judgment: Aporias of Liberal Freedom in Kant’s Critique of Judgment,” in Literary/Liberal Entanglements: Toward a Literary History for the Twenty-First Century, ed. Corinne Harol and Mark Simpson (Toronto: University of Toronto Press, 2017), 131–91, provides a critical account of the conceptual problems entailed by Kant’s equation of “freedom” with “play” and argues that these are also the aporias of liberalism (151–52). Soni contends that Kant’s concept of “free play” cannot provide a workable model for politics, because Kant’s concept of freedom as play “is only free because and for as long as it refuses to be directed toward any ends” (177) and hence necessarily leads to the model of “an infinite conversation . . . that can never properly conclude” (152). As Soni notes, this dimension of liberalism was criticized by critics such as Leo Strauss and Carl Schmitt, who stressed that “an infinite conversation” is “incapable of providing a ground for decision.” Against Kant’s model of free play, Soni suggests that rule-oriented games provide a better point of orientation for politics (179–81). While I agree with Soni that Kant is remarkably tight-lipped concerning the content of his concept of “play” (169), his representation of the regular, or self-regulated, play (regelmäßiges Spiel) of the imagination seems to open up Kant’s work to Soni’s preferred model of games.
57. Kant contended in the Critique of Judgment that “only in society is the beautiful of empirical interest. And if we grant that the urge to society is natural to man but that his fitness and propensity for it, i.e., sociability, is a requirement of man as a creature with a vocation for society and hence is a property pertaining to his humanity, then we must also inevitably regard taste as an ability to judge whatever allows us to communicate even our feeling to everyone else, and hence regard taste as a means of furthering something that everyone’s natural inclination demands” (CJ 163 [Ak 296–97]).
58. Though my use of the term “regulative play” seems to align Arendt’s and Zerilli’s approaches with Friedrich Schiller’s account of play in On the Aesthetic Education of Man, in a Series of Letters (New York: Frederick Ungar, 1965), both Arendt and Zerilli focus on actual differences among humans in a way that is absent in Schiller.

61. On the connection between the common world and aspirations for immortality, see Arendt, *The Human Condition*, 17–21.


63. As Arendt notes in *The Human Condition*, it is “characteristic of all natural processes that they come into being without the help of man,” and we describe as “automatic” “all courses of movement which are self-moving and therefore outside the range of willful and purposeful interference” (150–51).


77. Stigler, “The Theory of Economic Regulation,” 10. Stigler’s description of purchasing as “voting” was less a metaphor than Stigler’s attempt to express what he understood as the true meaning of voting. Since for Stigler all social relations are economic in nature, the political sense of “voting” is in fact a metaphor for what is fundamentally an economic act. Stigler thus used the term “voting” to describe economic purchases so that his readers would understand the political sense of voting in economic terms (rather than, for example, expanding their understanding of economic terms).

78. Nik-Khah, “George Stigler,” 141; see also Nik-Khah and Van Horn, “Inland Empire,” 270.


81. Neoliberal theorists also underscore the “classical liberal” provenance of an author such as Elinor Ostrom, who received the Nobel Prize in Economics for her research on the commons and who has also been claimed by the left. In his Introduction to Elinor Ostrom, *The Future of the Commons: Beyond Market Failure and Government Regulation*, with contributions by Christina Chang, Mark Pennington, and Vlad Tarko (London: Institute of Economic Affairs, 2010)—a book drawn from Ostrom’s lecture for the Institute of Economic Affairs’s annual Friedrich Hayek lecture—the business school professor Philip Booth insists that “in no sense do Professor Ostrom’s ideas conflict with the idea of a free economy” but rather they “sit firmly within the classical liberal tradition of political economy” (11, 15). See also Mark Pennington, “Elinor Ostrom, Common-Pool Resources, and the Classical Liberal Tradition,” in *The Future of the Commons*, 21–47.

83. Ecologist, *Whose Common Future?*. 7. Hardt and Negri’s account of the commons, though emphatically far left, is nevertheless more difficult to situate, since they are interested in contemporary commons produced half within, half outside the most modern formations of capitalist relations (e.g., immaterial labor).

84. Pennington, “Elinor Ostrom,” 40.


89. As I noted in Chapter 3, this premise underwrites Bruno Latour’s actor-network theory and is most convincingly exemplified in his *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988), in which he contends that it was by means of the alliances that Louis Pasteur established among his laboratory, other researchers, farmers, cows, and the anthrax bacillus itself that the latter became visible and could be treated medically.


94. Latour, *Politics of Nature*, 235; see also 151, 197.


96. Philip Mirowski, “What Is Science Critique? Lessig, Latour,” in *The Routledge Handbook of the Political Economy of Science*, ed. David Tyfield, Rebecca Lave, Samuel Randalls, and Charles Thorpe (New York: Routledge, 2017), 446. Mirowski notes that Latour’s proximity to neoliberalism is less evident if one considers only the Chicago School, for those economists indeed theorize self-regulating markets. However, there are “two factions” of the neoliberal movement—“one, the Chicago School, which upheld neoclassical theory as the gospel of the neoliberal movement; and the other, the Austrian variant, which rejected neoclassical economics as having any validity whatsoever” (446)—and Latour is much closer to the second wing (which includes Hayek).
97. In “On Some of the Affects of Capitalism,” Latour contends that “capitalism” is not a useful concept but rather a means of encouraging simultaneous optimism and pessimism, and he turns instead to locutions such as “the wide expansion of the reach of ‘market organizations’ along metrological chains” (11). Drawing on Ferdinand Braudel, Latour distinguishes between market relations and capitalism, arguing that “capitalism . . . feeds on, parasitizes and distorts marketplaces” (4) and suggests that revealing the conceptual incoherence of the concept of “the economy” and its aspiration of self-regulation will promote the weaker, and for him less problematic, form of market relations (which also aligns his position with that of neoliberal advocates of the commons).

98. See Mirowski’s “What Is Science Critique?” for a discussion of this lacuna within Latour’s work.

99. For a critical overview of the debate between “limits of growth” advocates and their procapitalist critics, see Melinda Cooper, Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era (Seattle: University of Washington Press, 2008), 15–50. Many of the most well-researched recent proposals for solving the problems of climate change—e.g., Stewart Brand, Whole Earth Discipline: Why Dense Cities, Nuclear Power, Transgenic Crops, Restored Wildlands, and Geoengineering Are Necessary (New York: Penguin, 2010); George Monbiot, Heat: How to Stop the Planet from Burning (Brooklyn: South End, 2009); Thomas L. Friedman, Hot, Flat, and Crowded: Why We Need a Green Revolution—and How It Can Renew America, 2nd ed. (New York: Farrar, Straus and Giroux, 2009); and Steven Stoft, Carbonomics: How to Fix the Climate and Charge It to OPEC (Nantucket, MA: Diamond, 2008)—seem to me liberal insofar as they seek to mediate among ecological limits, capitalism, and individual choice. See also David Collings’s astute point in Stolen Future, Broken Present: The Human Significance of Climate Change (Ann Arbor, MI: Open Humanities Press, 2014) that even minimal proposals for legislative regulation have failed in the United States precisely because, in the view of “free-market dogmatists . . . capitalism is more real than the biosphere” (81). On hopes that “smart” technologies can deliver ecological salvation, see Orit Halpern, Robert Mitchell, and Bernard Dionysius Geoghagen, “The Smartness Mandate: Notes toward a Critique,” Grey Room 68 (2017): 106–29.


