

Notes



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

1. William Wordsworth, *Lyrical Ballads, with Other Poems. In Two Volumes*, 1st ed. (London: Printed for T. N. Longman and O. Rees, Pasternoster-Row, 1800), 1:xx, v.

2. See Harold Bloom, “The Internalization of Quest-Romance,” in *Romanticism and Consciousness: Essays in Criticism*, ed. Harold Bloom (New York: Norton, 1970), 3–24.

3. E. M. Forster's classic account of round and flat characters appears in *Aspects of the Novel* (New York: Harvest, 1956), but Deidre Lynch's *The Economy of Character: Novels, Market Culture, and the Business of Inner Meaning* (Chicago: University of Chicago Press, 1998) provided a much-needed historical contextualization of the emergence of this distinction. On the increasingly numerous and individualized populations of nineteenth-century literature, see Alex Woloch, *The One vs. the Many: Minor Characters and the Space of the Protagonist in the Novel* (Princeton, NJ: Princeton University Press, 2003).

4. On the emergence of our modern concept of "literature," see Douglas Lane Patey, "The Eighteenth Century Invents the Canon," *Modern Language Studies* 18, no. 1 (1988): 17–37; M. H. Abrams, *Doing Things with Texts: Essays in Criticism and Critical Theory*, ed. Michael Fischer (New York: Norton, 1989), 144–46; John Guillory, *Cultural Capital: The Problem of Literary Canon Formation* (Chicago: University of Chicago Press, 1993), esp. 124–33; Terry Eagleton, *Literary Theory: An Introduction*, anniversary ed. (Malden, MA: Blackwell, 2008), 1–18; and Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, rev. ed. (New York: Oxford University Press, 2015), 134–38. On the rise of the concept of experimental literature, see Robert Mitchell, *Experimental Life: Vitalism in Romantic Science and Literature* (Baltimore, MD: Johns Hopkins University Press, 2014).

5. See Mark Rose, *Authors and Owners: The Invention of Copyright* (Cambridge, MA: Harvard University Press, 1993); and James Boyle, *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge, MA: Harvard University Press, 1996).

6. See Richard D. Altick, *The English Common Reader: A Social History of the Mass Reading Public, 1800–1900*, 2nd ed. (Columbus: Ohio State University Press, 1998); and Jon Klancher, *The Making of English Reading Audiences, 1790–1832* (Madison: University of Wisconsin Press, 1987).

7. See E. P. Thompson, *The Making of the English Working Class* (New York: Pantheon, 1964); Raymond Williams, *The Country and the City* (London: Chatto and Windus, 1973); Ian Watt, *The Rise of the Novel: Studies in Defoe, Richardson, and Fielding* (Berkeley: University of California Press, 1957); and Franco Moretti, *The Way of the World: The Bildungsroman in European Culture* (London: Verso, 1987).

8. See John B. Bender, *Imagining the Penitentiary: Fiction and the Architecture of Mind in Eighteenth-Century England* (Chicago: University of Chicago Press, 1987); D. A. Miller, *The Novel and the Police* (Berkeley: University of California Press, 1988); and Nancy Armstrong, *Desire and Domestic Fiction: A Political History of the Novel* (New York: Oxford University Press, 1987).

9. Watt, *The Rise of the Novel*, 92; Fredric Jameson, *The Political Unconscious: Narrative as a Socially Symbolic Act* (Ithaca, NY: Cornell University Press, 1981), 17–102, esp. 34; Armstrong, *Desire and Domestic Fiction*, 23–24; Miller, *The Novel and the Police*, x.

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.

13. Foucault’s approach thus also provides another way of approaching the question of the “communal” dimension of liberal approaches to social relations. For non-Foucauldian discussions of these issues, see L. T. Hobhouse, *Liberalism and Other Writings* (Cambridge: Cambridge University Press, 1994); Stefan Collini, *Liberalism and Sociology: L. T. Hobhouse and Political Argument in England, 1880–1914* (Cambridge: Cambridge University Press, 1979); and Alan Ryan, *The Making of Modern Liberalism* (Princeton, NJ: Princeton University Press, 2012), 91–106.

14. 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). I return to Malthus’s account of population, as well as competing models of population, in Chapters 1, 2, 3, and 6.

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.

17. Samuel Taylor Coleridge and William Wordsworth, *Lyrical Ballads, with a Few Other Poems* (London: Printed for J. & A. Arch, Gracechurch-Street, 1798), i; Edmund Burke, *Reflections on the Revolution in France, and on the Proceedings in Certain Societies in London Relative to That Event. In a Letter Intended to Have Been Sent to a Gentleman in Paris* (London: Printed for J. Dodsley, in Pall-Mall, 1790), 188.

18. An important exception is Jerome Christensen, *Romanticism at the End of History* (Baltimore, MD: Johns Hopkins University Press, 2000), which takes up explicitly the question of whether “Romantic liberalism” is an anachronism. Christensen concludes that, even if it is, we should nevertheless actively engage in such anachronism (see, e.g., 145–47). Christensen also stresses the different modes of Romantic liberalism (for example, the “corporate liberalism of Coleridge” versus the “bureaucratic liberalism of Scott” [8]), and his interest in “formulat[ing] a policy of cryptoliberalism that will motivate . . . a reconsideration of the kind of work that humanists should be doing” (8) resonates with my own interest in rethinking liberalism and biopolitics. Other recent discussions of relationships between Romanticism and liberalism include Peter L. Thorslev Jr., “Post-Waterloo Liberalism: The Second Generation,” *Studies in Romanticism* 28, no. 3 (1989): 437–61; Jonathan David Gross, *Byron: The Erotic Liberal* (Lanham, MD: Rowman & Littlefield, 2001); Julie Murray, “Company Rules: Burke, Hastings, and the Specter of the Modern Liberal State,” *Eighteenth-Century Studies* 41, no. 1 (2007): 55–69; Anne Frey, *British State Romanticism: Authorship, Agency, and Bureaucratic Nationalism* (Stanford, CA: Stanford University Press, 2010); Brent Lewis Russo, “Romantic Liberalism,” PhD diss., University of California–Irvine, 2014; Daniel Stout, *Corporate Romanticism: Liberalism, Justice, and the Novel* (New York: Fordham University Press, 2017); and Jamison Kantor, “Immortality, Romanticism, and the Limit of the Liberal Imagination,” *PMLA* 133, no. 3 (2018): 508–25. Scholars have more often linked German Romanticism to liberalism, though often by distinguishing Romanticism from liberalism and conservatism; see, for example, Frederick C. Beiser, *Enlightenment, Revolution, and Romanticism: The Genesis of Modern German Political Thought, 1790–1800* (Cambridge, MA: Harvard University Press, 1992). The relevant philosophical, historical, and literary-critical scholarship on eighteenth-, nineteenth-, and twentieth-century liberalism is vast, but I have found the following particularly helpful. Pierre Manent’s *An Intellectual History of Liberalism* (Princeton, NJ: Princeton University Press, 1994) and Ryan’s *The Making of Modern Liberalism* provide good philosophical-historical accounts of liberalism. Collini’s *Liberalism and Sociology*, Michael Freedman’s *The New Liberalism: An Ideology of Social Reform* (Oxford: Oxford

University Press, 1986), and Mitchell Dean's *The Constitution of Poverty: Toward a Genealogy of Liberal Governance* (New York: Routledge, 1991) are helpful intellectual-historical accounts of eighteenth- to early-twentieth-century liberalism. On the historical consolidation of the trinity of the "ideologies" of liberalism, conservatism, and Marxism in the nineteenth century, see Immanuel Maurice Wallerstein's *Unthinking Social Science: The Limits of Nineteenth-Century Paradigms* (Philadelphia: Temple University Press, 2001) and *The Modern World-System IV: Centrist Liberalism Triumphant, 1789–1914* (Berkeley: University of California Press, 2011). On the importance of built environments and technologies for liberalism, see Chris Otter, "Making Liberal Objects: British Techno-Social Relations, 1800–1900," *Cultural Studies* 21, no. 4–5 (2007): 570–90; and Chris Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800–1910* (Chicago: University of Chicago Press, 2008). On whether there is a specifically "liberal" aesthetics, see Lionel Trilling, *The Liberal Imagination* (New York: NYRB, 2008); Russell, "Aesthetic Liberalism"; and Amanda Anderson, *Bleak Liberalism* (Chicago: University of Chicago Press, 2016). For an account of the ways that the inherent paradoxes of the classical liberal, tort-based legal order led directly to population-based (and hence biopolitical) social insurance systems in the United States, see John Fabian Witt, *The Accidental Republic: Crippled Workingmen, Destitute Widows, and the Remaking of American Law* (Cambridge, MA: Harvard University Press, 2004). I have also profited immensely from Domenico Losurdo, *Liberalism: A Counter-History*, trans. Gregory Elliott (New York: Verso, 2011), which develops a well-researched and compelling account of liberalism always having been committed to a division between the small number of those "fit" for individual liberty and the much greater number of human beings who must be ruled in illiberal ways in order to secure freedom for the privileged few. I note at several points in this book the convergence between Losurdo's history of liberalism and Esposito's account of the "immunitary logic" of modernity, to which I return in this introduction.

19. See, e.g., Manent, *An Intellectual History of Liberalism*; and Ryan, *The Making of Modern Liberalism*.

20. John Stuart Mill, "Autobiography," in *Collected Works of John Stuart Mill*, 33 vols., ed. John M. Robson (Toronto: University of Toronto Press, 1963–1991), 1:149–53; and John Stuart Mill, *On Liberty*, in *Collected Works*, 18:261–62, 300. I discuss Mill at length in Chapter 5.

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 Ploy 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]).

23. Ryan, *The Making of Modern Liberalism*, 21.

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 liberalism, and suggests that, rather than being fully distinct modes of liberalism, political and economic liberalism instead are simply two different tactics for achieving the same end of limiting sovereign power.

26. See, e.g., Sara Emilie Guyer, *Reading with John Clare: Biopoetics, Sovereignty, Romanticism* (New York: Fordham University Press, 2015); Ron Broglio, *Beasts of Burden: Biopolitics, Labor, and Animal Life in British Romanticism* (Albany: State University of New York Press, 2017); Amy Mallory-Kani, "'Contagious Air(s)': Wordsworth's Poetics and Politics of Immunity," *European Romantic Review* 26, no. 6 (2015): 699–717; and the essays collected in the "Romanticism and Biopolitics" Praxis Series special issue of *Romantic Circles* (<https://www.rc.umd.edu/praxis/biopolitics>).

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).

28. See Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life*, trans. Daniel Heller-Roazen (Stanford, CA: Stanford University Press, 1998); and Giorgio Agamben, *Remnants of Auschwitz: The Witness and the Archive* (New York: Zone, 1999).

29. See especially Roberto Esposito, *Bíos: Biopolitics and Philosophy*, trans. Timothy Cambell (Minneapolis: University of Minnesota Press, 2008); Roberto Esposito, *Immunitas: The Protection and Negation of Life*, trans. Zakiya Hanafi (Malden: Polity, 2011); and Roberto Esposito, *Third Person: Politics of Life and Philosophy of the Impersonal*, trans. Zakiya Hanafi (Malden: Polity, 2012).

30. Esposito, *Bíos*, 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.

32. Benjamin Constant's 1819 "The Liberty of the Ancients Compared with That of the Moderns," in *Political Writings* (Cambridge: Cambridge University Press, 1988), 308–28, provides the classic liberal distinction between ancient and modern senses of liberty.

33. Esposito, *Bíos*, 70.

34. As Esposito stresses in *Bíos* (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 *Bíos* and *Third Person* present significantly different accounts of this relation. In *Bíos*, 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, *Bíos*, 12. With that said, Esposito does approach something like a positive claim about immunity and biopolitics in the final chapter of *Immunitas*, 145–77.

37. My approach also aligns with an apparent shift in Michel Foucault’s thinking, for though in *The Birth of Biopolitics: Lectures at the Collège de France, 1978–79*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2008) he positioned “liberalism as the general framework of biopolitics” (22n), he sought in his later lecture series, devoted to practices of “the care of the self,” to theorize something like an affirmative biopolitics. On this point, see especially Thomas Lemke, “Beyond Foucault: From Biopolitics to the Government of Life,” in *Governmentality: Current Issues and Future Challenges*, ed. Ulrich Bröckling, Susanne Krasmann, and Thomas Lemke (New York: Routledge, 2011); and Miguel Vatter, “Foucault and Hayek: Republican Law and Civil Society,” in *The Government of Life: Foucault, Biopolitics, and Neoliberalism*, ed. Vanessa Lemm and Miguel Vatter (New York: Fordham University Press, 2014), 163–84.

38. Useful accounts of the origins and nature of neoliberalism include Foucault, *The Birth of Biopolitics*, 51ff.; Philip Mirowski and Dieter Plehwe, eds., *The Road from Mont Pèlerin: The Making of the Neoliberal Thought Collective* (Cambridge, MA: Harvard University Press, 2009); and Philip Mirowski, *Never Let a Serious Crisis Go to Waste: How Neoliberalism Survived the Financial Meltdown* (New York: Verso, 2014). David Harvey’s *A Brief History of Neoliberalism* (New York: Oxford University Press, 2005) provides a helpful historical account of neoliberalism, though Harvey is not convinced of the utility of the term itself.

39. Mirowski discusses some reasons for this in *Never Let a Serious Crisis Go to Waste*; see also Naomi Klein, *The Shock Doctrine: The Rise of Disaster Capitalism*, 1st ed. (New York: Metropolitan, 2007).

40. For an overview of the logic of smartness, see Orit Halpern, Robert Mitchell, and Bernard Dionysius Geoghagen, “The Smartness Mandate: Notes toward a Critique,” *Grey Room* 68 (2017): 106–29.

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.

44. Michel Foucault, “Sexuality and Solitude,” in *The Essential Works of Foucault, 1954–1984*, vol. 1: *Ethics*, ed. Paul Rabinow (New York: The New Press, 1997), 177. Foucault explicitly distinguished technologies of the self from “techniques that permit one to determine the conduct of individuals”—that is, from “techniques of domination,” which have traditionally been the focus of Marxist analyses (but also, as Foucault notes, of his own earlier accounts of “discipline” in a work such as *Discipline and Punish*). Foucault developed brief discussions of governmentality in his lectures “Governmentality,” in *The Essential Works of Foucault, 1954–1984*, vol. 3: *Power*, ed. James D. Faubion (New York: The New Press, 2000), 201–22; and “‘Omnes et Singulatim,’” in *Essential Works*, 3:298–325; and extensive analyses of different ancient and early Christian practices of self-government in the lecture series *On the Government of the Living: Lectures at the Collège de France, 1979–80*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2014); *Hermeneutics of the Subject: Lectures at the Collège de France, 1981–82*, trans. Graham Burchell, ed. Frédéric Gros (New York: Palgrave Macmillan, 2005); *The Government of Self and Others: Lectures at the Collège de France, 1982–83*, trans. Graham Burchell, ed. Frédéric Gros (New York: Palgrave Macmillan, 2011); and *The Courage of the Truth: Lectures at the Collège de France, 1983–1984*, trans. Graham Burchell, ed. Frédéric Gros (New York: Palgrave Macmillan, 2011).

45. See especially Lemke, “Beyond Foucault”; and Thomas Lemke, “The Risks of Security: Liberalism, Biopolitics, and Fear,” in *The Government of Life: Foucault, Biopolitics, and Neoliberalism*, ed. Vanessa Lemm and Miguel Vatter (New York: Fordham University Press, 2014), 59–74.

1. Biopolitics, Populations, and the Growth of Genius

1. Michel Foucault reflects on biopolitics in *Society Must Be Defended: Lectures at the Collège de France, 1975–76*, trans. David Macey (New York: Picador, 2003); in *Security, Territory, Population: Lectures at the Collège de France, 1977–78*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2007); and in *The Birth of Biopolitics: Lectures at the Collège de France, 1978–79*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2008), which latter also contains his most extensive discussion of liberalism.

2. Frances Ferguson developed an early, important discussion of eighteenth-century population theory and literature in “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), 106–24; more recent discussions of literature and Malthusian concepts of population include Maureen N. McLane, *Romanticism and the Human Sciences: Poetry, Population, and the Discourse of the Species* (Cambridge: Cambridge University Press, 2000); Catherine Gallagher, *The Body Economic: Life, Death, and Sensation in Political Economy and the Victorian Novel* (Princeton, NJ: Princeton University Press, 2006); and Scott R. MacKenzie, *Be It Ever So Humble: Poverty, Fiction, and the Invention of the Middle-Class Home* (Charlottesville: University of Virginia Press, 2013). Charlotte Sussman’s recent *Peopling the World: Representing Human Mobility from Milton to Malthus* (Philadelphia: University of Pennsylvania Press, 2020) considers the implications of both pre-Malthusian and Malthusian population theory for literary study.

3. Foucault, *The Birth of Biopolitics*, 317.

4. William Petty, *Another Essay in Political Arithmetick, Concerning the Growth of the City of London with the Measures, Periods, Causes, and Consequences Thereof, 1682* (London: Printed by H. H. for Mark Pardoe, 1683), 38.

5. John Guillory, *Cultural Capital: The Problem of Literary Canon Formation* (Chicago: University of Chicago Press, 1993), 85–133.

6. William Petty, *Political Arithmetic, or a Discourse Concerning, the Extent and Value of Lands, People, Buildings [Etc.]* (London: Printed for Robert Clavel at the Peacock and Hen. Mortlock at the Phenix in St. Paul’s Church-yard, 1690), preface, unnumbered page. Petty pursued this project in other texts, such as *Another Essay in Political Arithmetick* and *Five Essays in Political Arithmetick* (London: Printed for Henry Mortlock, 1687). Ted McCormick’s *William Petty and the Ambitions of Political Arithmetic* (Oxford: Oxford University Press, 2009) provides a helpful introduction to political arithmetic and an account of the differing roles played by Petty in various histories of economic theory. See also Keith Tribe’s brief but helpful contextualization of political arithmetic in *Land, Labour, and Economic Discourse* (London: Routledge & Kegan Paul, 1978), 86–88. Important literary-critical approaches to political arithmetic include Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society* (Chicago: University of Chicago Press, 1998), 120–37; David Glimp, *Increase and Multiply: Governing Cultural Reproduction in Early Modern England* (Minneapolis: University of Minnesota Press, 2003), 146–80; and Charlotte Sussman, “The Colonial Afterlife of Political Arithmetic: Swift, Demography, and Mobile Populations,” *Cultural Critique* 56 (2004): 96–126.

7. Petty, *Political Arithmetic*, 1.
8. See, e.g., Joseph Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), 209–12.
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. Alban 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.
12. Petty, *Another Essay*, 28.
13. Petty, *Another Essay*, 29.
14. As George R. Havens notes in "Rousseau, Melon, and Sir William Petty," *Modern Language Notes* 55, no. 7 (1940): 499–503, Rousseau certainly knew of Petty and likely read at least one of Petty's texts on political arithmetic.
15. Jean-Jacques Rousseau, *Politics and the Arts: Letter to M. D'Alembert on the Theatre*, trans. Allan Bloom (Ithaca, NY: Cornell University Press, 1960), 60.
16. The relationship between political arithmetic and political economy has been contested since the mid-eighteenth century. Adam Smith famously distanced political economy from political arithmetic by claiming in *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) that he had "no great faith" in political arithmetic (1:534.30), while Karl Marx equally famously contended in *A Contribution to the Critique of Political Economy*, in Karl Marx and Friedrich Engels, *Collected Works*, 50 vols. (New York: International Publishers, 1859) that Petty was "the father of English political economy" (294n). More recent commentators have been equally divided, with some arguing that Petty laid important groundwork for political economy (e.g., Schumpeter, *History of Economic Analysis*, esp. 209–15; William Letwin, *The Origins of Scientific Economics: English Economic Thought, 1660–1776* [London: Methuen, 1963]), and others stressing significant differences between the two sciences (e.g., McCormick, *William Petty and the Ambitions of Political Arithmetic*).
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.
19. See Martha Woodmansee, "The Genius and the Copyright: Economic and Legal Conditions of the Emergence of the 'Author,'" *Eighteenth-Century Studies* 17, no. 4 (1984): 425–48; Martha Woodmansee, *The Author, Art, and the Market: Rereading the History of Aesthetics* (New York: Columbia University Press, 1994); Mark Rose, *Authors and Owners: The Invention of Copyright* (Cambridge, MA: Harvard University

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.

21. Sharpe, *Dissertation upon Genius*, 132.

22. Alexander Gerard, *An Essay on Genius* (London: Printed for W. Strahan; T. Cadell in the Strand, 1774), 3. As Tenger and Trolander stress in “Genius versus Capital,” almost all eighteenth-century commentators agreed that genius occurred in both the sciences and arts (169).

23. Edward Young, *Conjectures on Original Composition. In a Letter to the Author of Sir Charles Grandison* (London: Printed for A. Millar, in the Strand, and R. and J. Dodsley, in Pall-Mall, 1759), 47.

24. Sharpe, *Dissertation upon Genius*, 10.

25. Young, *Conjectures on Original Composition*, 42.

26. As Ronnie Young notes in “James Beattie and the Progress of Genius in the Aberdeen Enlightenment,” *Journal for Eighteenth-Century Studies* 36, no. 2 (2013): 245–61, for Scottish Enlightenment authors such as Alexander Gerard, William Duff, and James Beattie, debates on genius were part of curricular reforms at Marischal College in Aberdeen, Scotland; see also Paul B. Wood, *The Aberdeen Enlightenment: The Arts Curriculum in the Eighteenth Century* (Aberdeen: Aberdeen University Press, 1993).

27. Joseph Addison and Richard Steele, *The Spectator*, ed. Donald Frederic Bond (Oxford: Clarendon, 1965), 2:129.

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.”

29. M. H. Abrams, *The Mirror and the Lamp: Romantic Theory and the Critical Tradition* (New York: Oxford University Press, 1953), 198–200.

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

31. Foucault, *The Birth of Biopolitics*, 43–44; see also the classic account in Albert O. Hirschman, *The Passions and the Interests: Political Arguments for Capitalism before Its Triumph*, 20th anniversary ed. (Princeton, NJ: Princeton University Press, 1997).

32. Thomas Gray, *An Elegy Written in a Country Church Yard*, p. 7 (ll. 45–52). Page numbers refer to Gray's 1751 published text; line numbers in brackets refer to the version of the poem in Roger Lonsdale, Thomas Gray, William Collins, and Oliver Goldsmith, *The Poems of Thomas Gray, William Collins, Oliver Goldsmith* (New York: Norton, 1972), 103–41.

33. William Empson, *Some Versions of Pastoral* (New York: New Directions, 1974), 4.

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 Negroes 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.

38. Percy Bysshe Shelley, *Prometheus Unbound, a Lyrical Drama in Four Acts, with Other Poems* (London: C. and J. Ollier, 1820), 137. My thanks to Greg Lynall for reminding me of this passage in Shelley’s play.

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.

40. See Genevieve Miller, *The Adoption of Inoculation for Smallpox in England and France* (Philadelphia: University of Pennsylvania Press, 1957), 146–56.

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.

45. Richard Eyre, *A Sermon, Preached, at St. Andrew’s, Holborn, April the 25th 1765. On the Anniversary Meeting, of the Governors, of the Small-Pox Hospitals* (London: Printed by H. Woodfall, 1765), 17–18.

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.
48. William Wordsworth, *Lyrical Ballads, with Other Poems. In Two Volumes*, 1st ed. (London: Printed for T. N. Longman and O. Rees, Pasternoster-Row, 1800), 1:xviii–xix.
49. Useful accounts of the narrowing of the concept of literature include (in addition to Guillory) Douglas Lane Patey, “The Eighteenth Century Invents the Canon,” *Modern Language Studies* 18, no. 1 (1988): 17–37; M. H. Abrams, *Doing Things with Texts: Essays in Criticism and Critical Theory*, ed. Michael Fischer (New York: Norton, 1989), 144–46; Terry Eagleton, *Literary Theory: An Introduction*, anniversary ed. (Malden, MA: Blackwell, 2008), 1–18; and Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, rev. ed. (New York: Oxford University Press, 2015), 134–38.
50. Guillory, *Cultural Capital*, 133.
51. Guillory discusses the topic of genius only in passing and only in connection with literacy; see 364n17.
52. William Godwin, *The Enquirer, Reflections on Education, Manners, and Literature. In a Series of Essays* (London: Printed for G. G. and J. Robinson, Paternoster-Row, 1797), vi. On the differences in method, style, and aims between *Political Justice* and *The Enquirer*, see Jon Mee, “‘The Use of Conversation’: William Godwin’s Conversable World and Romantic Sociability,” *Studies in Romanticism* 50 (2001): 572, 580; Jon Klancher, “Godwin and the Republican Romance: Genre, Politics, and Contingency in Cultural History,” *Modern Language Quarterly* 56, no. 2 (1995): 153–54; and Victoria Myers, “William Godwin’s *Enquirer*: Between Oratory and Conversation,” *Nineteenth-Century Prose* 41, no. 1–2 (2014): 335–78. See also Tilottama Rajan, *The Supplement of Reading: Figures of Understanding in Romantic Theory and Practice* (Ithaca, NY: Cornell University Press, 1990), 167–70.
53. Godwin, *The Enquirer*, 4.
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.

59. On Wordsworth’s interest in the apocalyptic implications of the new sciences of geology, see David Collings, “After the Covenant: Romanticism, Secularization, and Disastrous Transcendence,” *European Romantic Review* 21, no. 3 (2010): 345–61.

60. William Wordsworth, *The Prelude, 1799, 1805, 1850: Authoritative Texts, Context and Reception, Recent Critical Essays* (New York: Norton, 1979), 154, ll. 38–40, 41, 45.

2. Imagining Population in the Romantic Era: *Frankenstein*, Books, and Readers

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

2. William Hazlitt, *A Reply to the Essay on Population, by the Rev. T. R. Malthus. In a Series of Letters. To Which Is Added, Extracts from the Essay, with Notes* (London: Printed for Longman, Hurst, Rees, and Orme, Paternoster-Row, 1807), 46; Percy Bysshe Shelley, *Prometheus Unbound, a Lyrical Drama in Four Acts, with Other Poems* (London: C. and J. Ollier, 1820), xiv. On Romantic critiques of Malthus, see Philip Connell, *Romanticism, Economics, and the Question of “Culture”* (Oxford: Oxford University Press, 2001), 13–61.

3. Karl Marx, *Capital: A Critique of Political Economy*, trans. Ben Fowkes (New York: Vintage, 1977), 1:767.

4. Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens III, *The Limits to Growth: A Report for the Club of Rome’s Project on the Predicament of Mankind* (New York: Universe, 1972); Garrett Hardin, “The Tragedy of the Commons,” *Science* 162, no. 3859 (1968): 248. For an account of Hardin within the history of ecology, see Sharon E. Kingsland, *The Evolution of American Ecology, 1890–2000* (Baltimore, MD: Johns Hopkins University Press, 2005), 220–21. On reactions to *The Limits of Growth* report, see Elodie Vieille Blanchard, “Modelling the Future: An Overview of the ‘Limits to Growth’ Debate,” *Centaurus* 52 (2010): 91–116; and Melinda Cooper, *Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era* (Seattle: University of Washington Press, 2008), 15–18.

5. See, e.g., David Warsh, *Knowledge and the Wealth of Nations: A Story of Economic Discovery* (New York: Norton, 2006), 50–51, 202.

6. See Philip Mirowski, *Science-Mart: Privatizing American Science* (Cambridge, MA: Harvard University Press, 2011); Luc Boltanski and Eve Chiapello, *The New Spirit of Capitalism*, trans. Gregory Elliott (New York: Verso, 2005); and Bruno Latour, “Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern,” *Critical Inquiry* 30 (2004): 225–48.

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. Knoepfelmacher, *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*.

9. Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France, 1977–78*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2007), 67.

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.

11. See, e.g., Daniel Bernoulli, “Essai d’une nouvelle analyse de la mortalité causée par la petite vérole,” in *Histoire de l’Académie Royale des Sciences* (Paris: De l’imprimerie royale, 1766), 2–45. On the importance of the concept of populations for the physiocrats, see Joseph J. Spengler, *French Predecessors of Malthus: A Study in Eighteenth-Century Wage and Population Theory* (Durham, NC: Duke University Press, 1942); and Foucault, *Security, Territory, Population*, 70–79.

12. Foucault, *Security, Territory, Population*, 62–63.

13. William Godwin, *Of Population: An Enquiry Concerning the Power of Increase in the Numbers of Mankind* (London: Printed for Longman, Hurst, Rees, Orme and Brown, 1820).

14. Foucault, *Security, Territory, Population*, 63.

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

16. Ernst Mayr, “Darwin and the Evolutionary Theory in Biology,” in *Evolution and Anthropology: A Centennial Appraisal*, ed. Betty J. Meggers (Washington, DC: Anthropological Society of Washington, 1959), 2.

17. See, for example, Ernst Mayr, *Animal Species and Evolution* (Cambridge, MA: Belknap Press of Harvard University Press, 1965), 360–99, 481–515.

18. Ernst Mayr, “Speciation and Selection,” *Proceedings of the American Philosophical Society* 93, no. 6 (1949): 516.

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

Francis Galton's stress on the variations of individuals within a population. See Elliott Sober, "Evolution, Population Thinking, and Essentialism," *Philosophy of Science* 47, no. 3 (1980): 350–83; and Piers J. Hale, "Finding a Place for the Anti-Malthusian Tradition in the Victorian Evolution Debates," in *New Perspectives on Malthus*, ed. Robert J. Mayhew (Cambridge: Cambridge University Press, 2016), 182–207. As Jody Hey points out in "Regarding the Confusion between the Population Concept and Mayr's 'Population Thinking,'" *Quarterly Review of Biology* 86, no. 4 (2011), Darwin in fact rarely used the term "population" (256–57), and so "population thinking" in Mayr's very specific sense required several additional post-Darwin conceptual innovations (258–62).

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.

22. Franco Moretti, *The Way of the World: The Bildungsroman in European Culture* (London: Verso, 1987), 44. Similar comparisons of primitive and modern technologies of socialization play an important, if often understated, role in other Marxist accounts of the institution of literature—see, e.g., Fredric Jameson, *The Political Unconscious: Narrative as a Socially Symbolic Act* (Ithaca, NY: Cornell University Press, 1981), 69–70, 77–79—as well as in Friedrich Kittler's account in "Über die

Sozialisation Wilhelm Meisters,” in *Dichtung als Sozialisationsspiel: Studien zu Goethe und Gottfried Keller*, ed. Gerhard Kaiser and Friedrich Kittler (Göttingen: Vandenhoeck & Ruprecht, 1978), 13–124.

23. Moretti, *The Way of the World*, 45.

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

25. Ian Watt, *The Rise of the Novel: Studies in Defoe, Richardson, and Fielding* (Berkeley: University of California Press, 1957), 92; Jameson, *The Political Unconscious*, 34, 17–102; Nancy Armstrong, *Desire and Domestic Fiction: A Political History of the Novel* (New York: Oxford University Press, 1987), 23–24.

26. Maureen N. McLane, *Romanticism and the Human Sciences: Poetry, Population, and the Discourse of the Species* (Cambridge: Cambridge University Press, 2000), 87.

27. Mary Wollstonecraft Shelley, *Frankenstein, or, the Modern Prometheus*, 3rd ed., ed. David Lorne Macdonald and Kathleen Dorothy Scherf (Peterborough: Broadview, 2012), 80–81.

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, 185, 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.

30. On Richardson’s claim to have invented a new “species,” see Michael McKeon, *The Origins of the English Novel, 1600–1740* (Baltimore, MD: Johns Hopkins University Press, 1987), 410; and William Park, “What Was New About the ‘New Species of Writing?’” *Studies in the Novel* 2, no. 2 (1970): esp. 112–19.

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,

“Mary Wollstonecraft Shelley,” <https://romantic-circles.org/editions/frankenstein/MShelley/mshelley>.

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.”

34. Scott, “Remarks on Frankenstein,” 620.

35. Anon., “Review of Frankenstein; or the Modern Prometheus,” *Edinburgh Magazine and Literary Miscellany* (1818): 249, 53.

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.

38. Montesquieu discussed populations in chapters CXII–CXVIII of his *Lettres persanes* (1721)—see *Persian Letters; Trans. Mr. Ozell* (London: Printed for J. Tonson, 1722), 2:150–78—and in the twenty-nine chapters of book 23 of *The Spirit of Laws* (1748); see *The Spirit of Laws; Translated from the French of M. De Secondat, Baron De Montesquieu, by Mr. Nugent*, trans. Thomas Nugent (London: Printed for J. Nourse, and P. Vaillant, 1752), 2:125–60. David Hume discussed population in “Of the Populousness of Antient Nations,” in *Essays and Treatises on Several Subjects* (Edinburgh: Printed for A. Kincaid, and A. Donaldson, 1753), 155–262. For discussions of Montesquieu’s understanding of the links among population growth, governmental type, and economics, see Joseph J. Spengler, *French Predecessors of Malthus: A Study in Eighteenth-Century Wage and Population Theory* (Durham, NC: Duke University Press, 1942), 212–23; and David B. Young, “Libertarian Demography: Montesquieu’s Essay on Depopulation in the *Lettres persanes*,” *Journal of the History of Ideas* 36, no. 4 (1975): 669–82. On Hume’s theory of population, see Rotwein’s introduction to “Of the Populousness of Antient Nations” in Hume, *Writings on Economics* (Madison: University of Wisconsin Press, 1955), lxxxviii–xc; Miller’s notes to Hume’s essay in *Essays, Moral, Political, and Literary*, ed. Eugene F. Miller (Indianapolis, IN: LibertyClassics, 1987), 377–464; and Ernest Campbell Mosser, “Hume and the Ancient-Modern Controversy, 1725–1752: A Study in Creative

Scepticism,” *University of Texas Studies in English* 28 (1949): 139–53. For more general discussion of pre-Malthus debates about population, see D. V. Glass, “The Population Controversy in Eighteenth-Century England. Part I. The Background,” *Population Studies* 6, no. 1 (1952): 69–91; Spengler, *French Predecessors of Malthus*; and Charles Emil Stangeland, “Pre-Malthusian Doctrines of Population: A Study in the History of Economic Theory,” *Studies in History, Economics and Public Law* 21, no. 3 (1904).

39. See, for example, Richard Price, *An Essay on the Population of England, from the Revolution to the Present Time*, 2nd ed. (London: Printed for T. Cadell, 1780), 26–29. For a reading of Price as, in fact, a “bourgeois radical”—i.e., liberal—rather than a republican, see Isaac Kramnick, *Republicanism and Bourgeois Radicalism: Political Ideology in Late Eighteenth-Century England and America* (Ithaca, NY: Cornell University Press, 1990), 176–80.

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, 1995), 179–82.

41. On the nineteenth-century explosion of statistical surveys of various kinds of populations, see Theodore M. Porter, *The Rise of Statistical Thinking, 1820–1900* (Princeton, NJ: Princeton University Press, 1986); Ian Hacking, *The Taming of Chance* (New York: Cambridge University Press, 1990); and Alain Desrosières, *The Politics of Large Numbers: A History of Statistical Reasoning*, trans. Camille Naish (Cambridge, MA: Harvard University Press, 1998).

42. See Franco Moretti’s *Signs Taken for Wonders*, 262–78; “The Slaughterhouse of Literature,” *Modern Language Quarterly* 61, no. 1 (2000): 207–27; *Graphs, Maps, Trees: Abstract Models for a Literary History* (New York: Verso, 2005); and *Distant Reading* (New York: Verso, 2013).

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).

46. Moretti, *Graphs, Maps, Trees*, 3–33.

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).

49. Moretti, *Graphs, Maps, Trees*, 8.

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.”

53. Friedrich A. von Hayek, “The Use of Knowledge in Society,” *American Economic Review* 35, no. 4 (1945): 519.

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.

56. On the neoliberal transformation of scientific research, see Philip Mirowski, *Science-Mart: Privatizing American Science* (Cambridge, MA: Harvard University Press, 2011). I expand on ways that scientific research instantiates population approaches in Robert Mitchell, “Biopolitics and Population Aesthetics,” *South Atlantic Quarterly* 115, no. 2 (2016): 367–98.

57. Though employing a different concept of population than that which I outline here, Nancy Armstrong and Len Tennenhouse come to similar conclusions in “The Problem of Population and the Form of the American Novel,” *American Literary History* 20, no. 4 (2008): 667–85; and the expansion of this argument in *Novels in the Time of Democratic Writing: The American Example* (Philadelphia: University of Pennsylvania Press, 2018).

3. Freed Indirect Discourse: Biopolitics, Population, and the Nineteenth-Century Novel

1. Hannah Arendt, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), 39.

2. Ian Watt, *The Rise of the Novel: Studies in Defoe, Richardson, and Fielding* (Berkeley: University of California Press, 1957); John B. Bender, *Imagining the Penitentiary: Fiction and the Architecture of Mind in Eighteenth-Century England* (Chicago: University of Chicago Press, 1987); Nancy Armstrong, *Desire and Domestic Fiction: A Political History of the Novel* (New York: Oxford University Press, 1987); D. A. Miller, *The Novel and the Police* (Berkeley: University of California Press, 1988). See Chapters 1 and 2 for further discussion of these literary critics.

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.

4. Francis Bacon, *The Essays, or Councils, Civil and Moral, of Sir Francis Bacon, Lord Verulam, Viscount St. Alban 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), 77–86.

5. See, e.g., Ted McCormick, “Population: Modes of Seventeenth-Century Demographic Thought,” in *Mercantilism Reimagined: Political Economy in Early Modern Britain and Its Empire*, ed. Philip J. Stern and Carl Wennerlind (Oxford: Oxford University Press, 2014), 25–45; Charlotte Sussman, “The Colonial Afterlife of Political Arithmetic: Swift, Demography, and Mobile Populations,” *Cultural Critique* 56 (2004): 96–126; and Chapter 1 of this volume.

6. Foucault, *Security, Territory, Population*, 62–63.

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.

9. Michel Foucault, “Sexuality and Solitude,” in *The Essential Works of Foucault, 1954–1984*, vol. 1: *Ethics*, ed. Paul Rabinow (New York: The New Press, 1997), 177.

10. Alex Woloch, *The One vs. the Many: Minor Characters and the Space of the Protagonist in the Novel* (Princeton, NJ: Princeton University Press, 2003), 32.

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.

12. For Zola’s own democratic political leanings, see Susanna Barrows, *Distorting Mirrors: Visions of the Crowd in Late Nineteenth-Century France* (New Haven, CT: Yale University Press, 1981), 93–113.

13. Émile Zola, *Germinal*, ed. and trans. Roger Pearson (New York: Penguin, 2004), 510; French original in *Les Rougon-Macquart, histoire naturelle et sociale d’une famille sous le Second Empire*, 5 vols., ed. Armand Lanoux and Henri Mitterand (Paris: Bibliothèque de la Pléiade), 1571.

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

Lester with Charles Stivale, ed. Constantin V. Boundas (New York: Columbia University Press, 1990), 321–33.

15. Daniel Defoe, *Robinson Crusoe: An Authoritative Text, Contexts, Criticism*, ed. Michael Shinagel (New York: Norton, 1994), 4, 13; Herman Melville, *Moby-Dick: A Norton Critical Edition*, ed. Hershel Parker (New York: Norton, 2018), 158, 148.

16. My approach has been assisted by recent literary-critical work on the role of population models within eighteenth-century fiction and prose, such as Charlotte Sussman's *Peopling the World: Representing Human Mobility from Milton to Malthus* (Philadelphia: University of Pennsylvania Press, 2020), and on the role of population-based statistics within Victorian fiction, such as Jesse Rosenthal, "The Large Novel and the Law of Large Numbers; Or, Why George Eliot Hates Gambling," *ELH* 77 (2010): 777–811; Emily Steinlight, "Dickens's 'Supernumeraries' and the Biopolitical Imagination of Victorian Fiction," *Novel: A Forum on Fiction* 43, no. 2 (2010): 227–50; and Nancy Armstrong and Len Tennenhouse, *Novels in the Time of Democratic Writing: The American Example* (Philadelphia: University of Pennsylvania Press, 2018).

17. Frank Norris, *The Octopus: A Story of California* (New York: Bantam, 1971), 39.

18. Theodore Dreiser, *The Financier* (New York: Penguin, 2008), 3. My interest in animals as minor characters is indebted to earlier historical and literary-critical work on the role of animals in nineteenth-century literature, including Harriet Ritvo, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, MA: Harvard University Press, 1987); Deborah Denenholz Morse and Martin A. Danahay, *Victorian Animal Dreams: Representations of Animals in Victorian Literature and Culture* (Aldershot: Ashgate, 2007); James Turner, *Reckoning with the Beast: Animals, Pain, and Humanity in the Victorian Mind* (Baltimore, MD: Johns Hopkins University Press, 1980); and Christine Kenyon-Jones, *Kindred Brutes: Animals in Romantic-Period Writing* (Aldershot: Ashgate, 2001). Yet because I see plants, diseases, and transportation technologies as equally likely minor characters in nineteenth-century novels, the lens through which I consider animals as characters differs from much of the work listed here. In thinking about these literary examples, I have found especially useful Phillip Thurtle's discussion of trotter horses in Wharton's *The Age of Innocence* and the squid and the lobster in Dreiser's *The Financier*. Phillip Thurtle, *The Emergence of Genetic Rationality: Space, Time, and Information in American Biological Science, 1870–1920* (Seattle: University of Washington Press, 2007). Thurtle helpfully demonstrates how the animals in these novels are connected to larger questions of populations, breeding, heredity, and the emerging sciences of genetics. I have also found useful Ivan Kreilkamp, "Dying Like a Dog in *Great Expectations*," in Morse and Danahay, *Victorian Animal Dreams*, 81–94 (in part because Kreilkamp explicitly connects animals to Woloch's concept of minor characters); and Ron Broglio, *Beasts of Burden: Biopolitics, Labor, and Animal Life in British Romanticism* (Albany: State University of New York Press, 2017).

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].

25. Thomas Mann, *Buddenbrooks*, trans. John E. Woods (New York: Vintage, 1993), 725–26; German original from *Buddenbrooks* (Frankfurt am Main: Fischer Taschenbuch Verlag, 1989), 754.

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 mineworkers 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.

27. See Émile Zola, “The Experimental Novel,” in *The Experimental Novel and Other Essays* (New York: Haskell House, 1964), 1–54.

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.

29. Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988), 159.

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).

31. For Lukács’s attacks on Zola, see Georg Lukács, “Narrate or Describe?,” in *Writer & Critic and Other Essays*, ed. A. D. Kahn (New York: Universal Library, 1971), 110–48; and the chapters on Zola in Georg Lukács, *Studies in European Realism*, trans. Edith Bone (New York: Howard Fertig, 2002).

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.

34. Jane Austen, *Emma: An Authoritative Text, Contexts, Criticism*, ed. George Justice (New York, Norton, 2012), 15.

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 those 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].

38. Deleuze, *The Logic of Sense*, 321, 324–25.

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.

43. Arendt, *The Human Condition*, 178.

44. Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy* (Cambridge, MA: Harvard University Press, 2004), 65, 66.

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, *Graphs, Maps, Trees: Abstract Models for a Literary History* (New York: Verso, 2005), 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).

47. Miller, *The Novel and the Police*, 25; Finch and Bowen, “‘The Tittle-Tattle of Highbury,’” 14.

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).

51. For Dickens’s and Eliot’s engagements with statistics—and, by implication, population—see Steinlight, “Dickens’s ‘Supernumeraries’”; Rosenthal, “The Large Novel and the Law of Large Numbers”; and Caroline Levine, “The Enormity Effect: Realist Fiction, Literary Studies, and the Refusal to Count,” *Genre* 50, no. 1 (2017): 59–75.

4. Building Beaches: Global Flows, Romantic-Era Terraforming, and the Anthropocene

1. Erasmus Darwin, *The Botanic Garden, a Poem, in Two Parts*, 4th ed. (London: Printed for J. Johnson, St. Paul's Church-Yard, 1799), vol. I, canto IV, p. 208, note to l. 320. *The Botanic Garden* was tremendously popular when it appeared, but interest fell off in the later nineteenth century to the point that, as Erasmus Darwin's grandson Charles Darwin noted in his "Life of Erasmus Darwin" for the translation of Ernst Krause's *Erasmus Darwin* (1879), "notwithstanding the former high estimation of his poetry by men of all kinds in England, no one of the present generation reads, as it appears, a single line of it." Charles Darwin, *Charles Darwin's "The Life of Erasmus Darwin,"* ed. Desmond King-Hele (Cambridge: Cambridge University Press, 2002), 33–34. For helpful accounts of the reasons behind this eclipse of interest, see Noel Jackson, "Rhyme and Reason: Erasmus Darwin's Romanticism," *Modern Language Quarterly* 70, no. 2 (2009): 171–94; and Dahlia Porter, *Science, Form, and the Problem of Induction in British Romanticism* (Cambridge: Cambridge University Press, 2018), 73–112. Devin Griffiths, *The Age of Analogy: Science and Literature between the Darwins* (Baltimore, MD: Johns Hopkins University Press, 2016), suggests that this decline in the popularity of Erasmus Darwin's verse obscures the fact that many of his premises continued to inform both science and literature in the nineteenth century.

2. Paul Foot, *Red Shelley* (London: Sidgwick & Jackson, 1980), 227–73, documents the long afterlife of *Queen Mab* in nineteenth-century British radical labor movements.

3. See Paul J. Crutzen, "Geology of Mankind," *Nature* 415, no. 6867 (2002): 23; for contextualization of Crutzen's seminal article, see Jeremy Davies, *The Birth of the Anthropocene* (Oakland: University of California Press, 2016).

4. Mary A. Favret, "War in the Air," *Modern Language Quarterly* 65, no. 4 (December 2004): 538, 543; also included in *War at a Distance: Romanticism and the Making of Modern Wartime* (Princeton, NJ: Princeton University Press, 2009). See also Fabien Locher and Jean-Baptiste Fressoz, "Modernity's Frail Climate: A Climate History of Environmental Reflexivity," *Critical Inquiry* 38, no. 3 (2012): 579–98. For expanded versions of Favret's concise description of this shift in weather science, see Vladimir Janković, *Reading the Skies: A Cultural History of English Weather, 1650–1820* (Chicago: University of Chicago Press, 2000).

5. John Dalton, *Meteorological Observations and Essays* (London: Printed for W. Richardson, J. Phillips, and W. Pennington, 1793), 76.

6. Darwin, *The Botanic Garden*, vol. I: 414 (note XXXIII).

7. John Williams, *The Climate of Great Britain; or Remarks on the Change It Has Undergone, Particularly within the Last Fifty Years* (London: C. and R. Baldwin, 1806), 334.

8. 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), 183–84.

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

labor and land. The processes of enclosure and “improvement,” for example, meant—despite what a term such as “enclosure” initially seems to imply—dissolving local land rights associated with traditional commons so that large tracts of land could be dealt with as homogenous units and untethering production from local communities so that an abstract “laborer” could move “freely” between countryside and cities. See, e.g., H. C. Darby, *A New Historical Geography of England* (Cambridge: Cambridge University Press, 1973), 302–89. In even more explicit fashion, the slave trade meant forcibly removing African peoples from local contexts so that they could be inserted into global networks. See, e.g., Eric Eustace Williams, *Capitalism and Slavery* (Chapel Hill: University of North Carolina Press, 1994). For compelling accounts of the ways that these processes of untethering modified the meaning and mission of Romantic-era literature, see Alan Liu, *Wordsworth: The Sense of History* (Stanford, CA: Stanford University Press, 1989); and Ian Baucom, *Specters of the Atlantic: Finance Capital, Slavery, and the Philosophy of History* (Durham, NC: Duke University Press, 2005).

10. Dalton, *Meteorological Observations*, 90.

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*.

12. Dalton, *Meteorological Observations*, 91.

13. Malthus, *An Essay on the Principle of Population*, 14.

14. Immanuel Kant, “Perpetual Peace: A Philosophical Sketch,” in *Kant: Political Writings*, ed. Hans Siegbert Reiss, trans. H. B. Nisbet (Cambridge: Cambridge University Press, 1990), 106. My thanks to Evan Gottlieb for drawing my attention to this aspect of Kant’s text.

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).

16. Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1987), 215–57.

17. For a discussion of networks and research on Earth’s magnetic field, see Tim Fulford, Debbie Lee, and Peter J. Kitson, *Literature, Science, and Exploration in the Romantic Era: Bodies of Knowledge* (Cambridge: Cambridge University Press, 2004), 149–66; and Patricia Fara, *Sympathetic Attractions: Magnetic Practices, Beliefs, and*

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.

18. Fulford, Lee, and Kitson, *Literature, Science, and Exploration*, 153.

19. Dalton, *Meteorological Observations*, 11–17, 36–38.

20. Janković, *Reading the Skies*, 156, 158.

21. Fulford, Lee, and Kitson, *Literature, Science and Exploration*, 13.

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*, I, 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.

27. Alan Bewell, *Romanticism and Colonial Disease* (Baltimore, MD: Johns Hopkins University Press, 1999), 31; see also 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.

28. Bewell, “Erasmus Darwin’s Cosmopolitan Nature,” 21.

29. Darwin, *The Botanic Garden*, I: iii.
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).
33. Shelley's notes on vegetarianism in *Queen Mab* served as the basis for his published pamphlet *A Vindication of Natural Diet*. For a nuanced discussion of Shelley's vegetarianism, see Timothy Morton, "Sustaining Natures: Shelley and Ecocriticism," in *Shelley and the Revolution in Taste* (Cambridge: Cambridge University Press, 1994); and Timothy Morton, "Joseph Ritson, Percy Shelley, and the Making of Romantic Vegetarianism," *Romanticism* 12, no. 1 (2006): 52–61.
34. Shelley, *Queen Mab*, 233, 232.
35. Percy Bysshe Shelley, "Mont Blanc; Lines Written in the Vale of Chamouni," in *Shelley's Poetry and Prose*, ed. Donald H. Reiman and Sharon B. Powers (New York: Norton, 1977), 89 (ll. 1–2).
36. Timothy Morton, *The Poetics of Spice: Romantic Consumerism and the Exotic* (Cambridge: Cambridge University Press, 2000), 93.
37. I expand on this sense of excentricity in Robert Mitchell, "Cryptogamia," *European Romantic Review* 21, no. 5 (2010): 631–51.
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), 264. 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.
39. Shelley, *Queen Mab*, 14 (Canto I).

40. Anna Letitia Barbauld, “A Summer Evening’s Meditation,” in *Poems* (London: Printed for Joseph Johnson, 1773), 136.

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).

44. Ian Baucom, “History 4^o: Postcolonial Method and Anthropocene Time,” *Cambridge Journal of Postcolonial Literary Inquiry* 1, no. 1 (2014): 140. The other, perhaps more common, critique of both Chakrabarty and the concept of the Anthropocene more generally is that blaming humans in general for global warming ignores the very specific kinds of human relations that have led to these threats; see, e.g., Jason W. Moore, “The Capitalocene, Part I: On the Nature and Origins of Our Ecological Crisis,” *Journal of Peasant Studies* 44, no. 3 (2017): 594–63.

45. Dipesh Chakrabarty, “Baucom’s Critique: A Brief Response,” *Cambridge Journal of Postcolonial Literary Inquiry* 1, no. 2 (2014): 250. For a useful contextualization of Chakrabarty’s essay within the tradition of literary-critical approaches to relationships between literature and the sciences, see Devin Griffiths, “Romantic Planet: Science and Literature within the Anthropocene,” *Literature Compass* 14, no. 1 (2017).

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^o," 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.

49. Marjorie Levinson, "A Motion and a Spirit: Romancing Spinoza," *Studies in Romanticism* 46, no. 4 (2007): 386. For Shelley's interest in Spinoza, see Fazel Abroon, "Necessity and the Origin of Evil in the Thought of Spinoza and Shelley," *Keats-Shelley Review* 14 (2000): 56–70; and Colin Jager, "Shelley after Atheism," *Studies in Romanticism* 49, no. 4 (2010): 611–31.

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).

51. Arendt, *The Human Condition*, 1.
52. Melinda Cooper, *Life as Surplus: Biotechnology and Capitalism in the Neoliberal Era* (Seattle: University of Washington Press, 2008), 15–18.
53. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, and William W. Behrens III, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe, 1972), 86; cited in Cooper, *Life as Surplus*, 16.
54. Cooper, *Life as Surplus*, 18.
55. Julian Lincoln Simon, *The Ultimate Resource 2*, 2nd ed. (Princeton, NJ: Princeton University Press, 1996), 66; cited in Cooper, *Life as Surplus*, 18.
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.
57. "Generation Starships," *Encyclopedia of Science Fiction*, http://www.sf-encyclopedia.com/entry/generation_starships.
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.
60. Malthus, *An Essay on the Principle of Population*, 369.
61. I discuss further the importance of the category of "moral restraint" for Malthus's text in Chapter 6.
62. Chris Otter, "The Technosphere: A New Concept for Urban Studies," *Urban History* 44, no. 1 (2017): 151–52.
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).

64. See “Regeneration,” in Ephraim Chambers, *Cyclopaedia: Or, an Universal Dictionary of Arts and Sciences*, 4 vols. (London: Rivington et al., 1778).

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.

67. Bill McKibben, *Eaarth: Making a Life on a Tough New Planet* (New York: Time, 2010).

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).

69. McKibben, *Eaarth*.

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

1. John Stuart Mill, *On Liberty*, in *Collected Works of John Stuart Mill*, ed. John M. Robson (Toronto: University of Toronto Press, 1963–1991), 18:281. Mill also used the phrase “experiments of living” (261).

2. Louis Lasagna, “A Plea for the ‘Naturalistic’ Study of Medicines,” *European Journal of Clinical Pharmacology* 7 (1974): 153. More specifically, Lasagna proposed that doctors would inform patients—now thought of more as autonomous consumers—of the possible risks of such treatments, and each patient–consumer would “make his own judgment” about whether to take the experimental drug. Louis Lasagna, “Consensus among Experts: The Unholy Grail,” *Perspectives in Biology and Medicine* 19, no. 4 (1976): 547. On the neoliberal background of Lasagna’s proposal, see Edward Nik-Khah, “Neoliberal Pharmaceutical Science and the Chicago School of Economics,” *Social Studies of Science* 44, no. 4 (2014): 489–517.

3. On these developments, see Nikolas S. Rose, *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century* (Princeton, NJ: Princeton University Press, 2007), esp. 131–54. On population-level tissue- and data-gathering protocols, see Robert Mitchell and Catherine Waldby, “National Biobanks: Clinical Labour, Risk Production, and the Creation of Biovalue,” *Science, Technology, and*

Human Values 35, no. 3 (2010): 330–55; and Robert Mitchell, “US Biobanking Strategies and Biomedical Immaterial Labor,” *Biosocieties* 7, no. 3 (2012): 224–44. On the more general development of population-level data-gathering techniques, see Orit Halpern, Robert Mitchell, and Bernard Dionysius Geoghagen, “The Smartness Mandate: Notes toward a Critique,” *Grey Room* 68 (2017): 106–29.

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.

5. For discussion of Arbuthnot’s background and interest in the smallpox inoculation debate, see Genevieve Miller, *The Adoption of Inoculation for Smallpox in England and France* (Philadelphia: University of Pennsylvania Press, 1957), 106–11; and Andrea Alice Rusnock, *Vital Accounts: Quantifying Health and Population in Eighteenth-Century England and France* (Cambridge: Cambridge University Press, 2002), 43–70.

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 abuse 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*

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), 14.

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).

17. Edmund Burke, *Reflections on the Revolution in France, and on the Proceedings in Certain Societies in London Relative to That Event. In a Letter Intended to Have Been Sent to a Gentleman in Paris* (London: Printed for J. Dodsley, in Pall-Mall, 1790), 44–45.

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.

25. Mill, *On Liberty*, 260–61.

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 *Berlinische 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).

31. Johann Gottfried Herder, “On the Cognition and Sensation of the Human Soul (1778),” in *Philosophical Writings* (Cambridge: Cambridge University Press, 2002), 236.

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.

33. On the importance of individual diversity and conversations for the Pietists, see James Daryl Clowes, "'Of Art and Women I Had No Knowledge': The Development of Schleiermacher's Understanding of Cognition, Self Identity, Community and Gender," PhD diss., University of Washington, 1996, 38–44; and Koppel S. Pinson, *Pietism as a Factor in the Rise of German Nationalism* (New York: Columbia University Press, 1934), 60–90.

34. Mill, *On Liberty*, 267.

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.

37. Friedrich A. von Hayek, *The Road to Serfdom: Text and Documents* (Chicago: University of Chicago Press, 2007), 100.

38. Friedrich A. von Hayek, "The Use of Knowledge in Society," *American Economic Review* 35, no. 4 (1945): 519.

39. That is, competition is the most "efficient" means of planning, since it makes the "full[est] 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.
43. Hayek, *The Road to Serfdom*, 46.
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 nationhood,” 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.
45. Hayek, “The Use of Knowledge in Society,” 526.
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).
47. Mill, *On Liberty*, 292–93.
48. Hayek, *The Road to Serfdom*, 125, 126.
49. Foucault captured this aspect in his suggestion that neoliberalism demands that each individual become an “entrepreneur of himself” (*The Birth of Biopolitics*:

Lectures at the Collège de France, 1978–79, trans. Graham Burchell, ed. Michel Senellart [New York: Palgrave Macmillan, 2008], 226), a phrase that captured the attention of many critics. See, e.g., Philip Mirowski, *Never Let a Serious Crisis Go to Waste: How Neoliberalism Survived the Financial Meltdown* (New York: Verso, 2014), 93–102; and Wendy Brown, *Undoing the Demos: Neoliberalism's Stealth Revolution* (New York: Zone, 2015), 79–11. Foucault's description is accurate, but I would stress the close connection between Mill's earlier concept of experiments in living and the neoliberal concept of an entrepreneurship of the self. The latter is, in essence, what happens to the concept of experiments in living when these are understood as necessarily market based.

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."

52. Ulrich Beck, *Risk Society: Towards a New Modernity*, trans. Mark Ritter (London: Sage, 1992), 19.

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.

56. For a chilling account of the neoliberal use of the lack of consensus among experts to pursue specific promarket agendas, see Mirowski, *Never Let a Serious Crisis Go to Waste*, 223–30. Mirowski builds on Robert Proctor's concept of "agnotology" (the uses of ignorance) developed in Robert Proctor and Londa L. Schiebinger, *Agnotology: The Making and Unmaking of Ignorance* (Stanford, CA: Stanford University Press, 2008); and Robert Proctor, *Golden Holocaust: Origins of the Cigarette Catastrophe and the Case for Abolition* (Berkeley: University of California Press, 2011). See also Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York: Bloomsbury, 2010).

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.

59. Mill, *On Liberty*, 217–18.

60. Roberto Esposito, *Bios: Biopolitics and Philosophy*, trans. Timothy Campbell (Minneapolis: University of Minnesota Press, 2008), 71.

61. For helpful discussion of the relationship of Esposito's approach to immunity to those of other contemporary theorists such as Niklas Luhmann, Peter Sloterdijk, Donna Haraway, and Jacques Derrida, see Timothy C. Campbell, *Improper Life: Technology and Biopolitics from Heidegger to Agamben* (Minneapolis: University of Minnesota Press, 2011); and Cary Wolfe, *Before the Law: Humans and Other Animals in a Biopolitical Frame* (Chicago: University of Chicago Press, 2013), esp. 38, 90–94.

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).

63. Beck, *Risk Society*, 58.

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).

67. Hannah Arendt, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), 57.

68. Michel Foucault, “The Risks of Security,” in *The Essential Works of Foucault, 1954–1984*, vol. 3: *Power*, ed. James D. Faubion (New York: The New Press, 2000), 366.

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

1. Michel Foucault, *Society Must Be Defended: Lectures at the Collège de France, 1975–76*, trans. David Macey (New York: Picador, 2003), 239–64; Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France, 1977–78*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2007), 29–53, 333–61; Michel Foucault, *The Birth of Biopolitics: Lectures at the Collège de France, 1978–79*, trans. Graham Burchell, ed. Michel Senellart (New York: Palgrave Macmillan, 2008), 129–57.

2. Foucault, *Security, Territory, Population*, 29–49.

3. Antoine Laurent Lavoisier and Armand Seguin, *Premier mémoire sur la transpiration des animaux*, in *Œuvres de Lavoisier: Publiées par les soins de son excellence le Ministre de l’instruction publique et des cultes* (Paris: Imprimerie impériale, 1862), 2:713. On the Regulator movement, see William S. Powell, ed., *The Regulators in North Carolina: A Documentary History, 1759–1776* (Raleigh: State Department of Archives and History, 1971). Mary Wollstonecraft, *A Vindication of the Rights of Woman: With Strictures on Political and Moral Subjects* (London: Printed for J. Johnson, No. 72, St. Paul’s Church Yard, 1792), 36; Mary Wollstonecraft Shelley, *Frankenstein, or, the Modern Prometheus*, 3rd ed., ed. David Lorne Macdonald and Kathleen Dorothy Scherf (Peterborough: Broadview, 2012), 52.

4. Jane Austen, *Pride and Prejudice* (New York: Penguin, 1972), 198.

5. As a consequence of space considerations, I consider only “theoretical” (e.g., economic and philosophical) Romantic-era texts in this chapter. For discussion of ways that the discourse of regulation bears on Romantic-era poems and novels, see Robert Mitchell, “Regulating Life: Romanticism, Science, and the Liberal Imagination,” *European Romantic Review* 29, no. 3 (2018): 275–93; and Robert Mitchell, “*Frankenstein* and the Sciences of Self-Regulation,” forthcoming.

6. Jon Mee, *Romanticism, Enthusiasm, and Regulation: Poetics and the Policing of Culture in the Romantic Period* (New York: Oxford University Press, 2005); D. A. Miller, *The Novel and the Police* (Berkeley: University of California Press, 1988). See also Alan Richardson’s discussion in *Literature, Education, and Romanticism: Reading as Social Practice, 1780–1832* (Cambridge: Cambridge University Press, 1994), 185–202, of Romantic novelists’ aspirations to engender “well-regulated minds” by means of the domestic novel.

7. Georges Canguilhem, *Ideology and Rationality in the History of the Life Sciences* (Cambridge, MA: MIT Press, 1988), 81–102; Randy E. Barnett, *Restoring the Lost Constitution: The Presumption of Liberty* (Princeton, NJ: Princeton University Press,

2004), 302–13; Michael Friedman, “Regulative and Constitutive,” *Southern Journal of Philosophy* 30 (1991): 73–102. On the biological sense of regulation, see also E. F. Adolph, “Early Concepts of Physiological Regulation,” *Physiology Reviews* 41 (1961): 737–70. See as well Canguilhem’s helpful effort to distinguish biological from social self-regulation in *The Normal and the Pathological*, trans. Carolyn R. Fawcett in collaboration with Robert S. Cohen (New York: Zone, 1991), 237–56.

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.”

9. Henry III, c. 25, cited in Julian Hoppit, “Reforming Britain’s Weights and Measures, 1660–1824,” *English Historical Review* 108, no. 426 (1993): 82.

10. For accounts of the history of measures in sixteenth- through nineteenth-century England, see Hoppit, “Reforming Britain’s Weights and Measures”; Witold Kula, *Measures and Men* (Princeton, NJ: Princeton University Press, 1986); Ronald Edward Zupko, *Revolution in Measurement: Western European Weights and Measures since the Age of Science* (Philadelphia: American Philosophical Society, 1990); and Aashish Velkar, *Markets and Measurements in Nineteenth-Century Britain* (Cambridge: Cambridge University Press, 2012).

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).

12. Gottfried Wilhelm Leibniz, *Essais de théodicée sur la bonté de dieu, la liberté de l’homme et l’origine du mal: Nouvelle édition, augmentée de l’histoire de la vie & des ouvrages de l’auteur, par M. L. de Neufville* (Amsterdam: F. Changuion, 1734), 1:xxxii; Canguilhem, *Ideology and Rationality*, 84. For Clarke’s description of the way that God allows his creation “to move regularly,” see Samuel Clarke, Gottfried Wilhelm Leibniz, and Isaac Newton, *The Leibniz-Clarke Correspondence, Together with Extracts from Newton’s “Principia” and “Opticks”* (Manchester: Manchester University Press, 1956), 13–14.

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 Christian 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/philem/personal/mcl_regulation.pdf, 3–5.

15. On the context of Locke’s writing, see Kelly’s general introduction to John Locke, *Locke on Money*, ed. P. H. Kelly (Oxford: Oxford University Press, 1991); and James Thompson, *Models of Value: Eighteenth-Century Political Economy and the Novel* (Durham, NC: Duke University Press, 1996), 41–72.

16. John Locke, *Some Considerations of the Consequences of the Lowering of Interest, and Raising the Value of Money*, in *Locke on Money*, 210.

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 Oeconomy: 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.

22. 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), I:L.v (47–64). Smith found an additional way to valorize the limited perspectives of individuals,

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.I.i.8 [20]). 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).

25. Edmund Burke, *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* (London: Printed for R. and J. Dodsley, in Pall-Mall, 1759), 6.

26. David Hume, "Of the Standard of Taste," in *Four Dissertations* (London: Printed for A. Millar, 1757), 203, 204.

27. Burke, *A Philosophical Enquiry*, 14.

28. Hume, "Of the Standard of Taste," 203.

29. I draw especially on the following discussions of Malthus: Kenneth Smith, "The Malthusian Controversy," thesis, University of London, 1951; 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), 106–24; Mitchell Dean, *The Constitution of Poverty: Toward a Genealogy of Liberal Governance* (New York: Routledge, 1991), 87–105; Donald Winch, *Riches and Poverty: An Intellectual History of Political Economy in Britain, 1750–1834* (Cambridge: Cambridge University Press, 1996), 221–405; Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society* (Chicago: University of Chicago Press, 1998), 278–95; and David Collings, *Monstrous Society: Reciprocity, Discipline, and the Political Uncanny, c. 1780–1848* (Lewisburg, PA: Bucknell University Press, 2009), 161–92. Whenever possible, I cite from Thomas

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.”

30. See Joseph J. Spengler, *French Predecessors of Malthus: A Study in Eighteenth-Century Wage and Population Theory* (Durham, NC: Duke University Press, 1942); Foucault, *Security, Territory, Population*, 29–86.

31. See Genevieve Miller, *The Adoption of Inoculation for Smallpox in England and France* (Philadelphia: University of Pennsylvania Press, 1957); and Foucault, *Security, Territory, Population*, 55–86.

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).

33. For helpful accounts of Malthus’s Romanticism, see Ferguson, “Malthus, Godwin, Wordsworth”; Tim Fulford, “Apocalyptic Economics and Prophetic Politics: Radical and Romantic Responses to Malthus and Burke,” *Studies in Romanticism* 40, no. 3 (2001): 345–68; and Collings, *Monstrous Society*, 161–92.

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).

35. William Hazlitt, *A Reply to the Essay on Population, by the Rev. T. R. Malthus. In a Series of Letters. To Which Is Added, Extracts from the Essay, with Notes* (London: Printed for Longman, Hurst, Rees, and Orme, Paternoster-Row, 1807), 44–45.

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

37. Hazlitt, *A Reply to the Essay on Population*, 46.

38. See esp. Roberto Esposito, *Bíos: Biopolitics and Philosophy*, trans. Timothy Campbell (Minneapolis: University of Minnesota Press, 2008); and Roberto Esposito, *Immunitas: The Protection and Negation of Life*, trans. Zakiya Hanafi (Malden: Polity, 2011).

39. Esposito, *Bíos*, 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).

40. Esposito, *Immunitas*, 8.
41. Hazlitt, *A Reply to the Essay on Population*, 44.
42. Kant uses “regulative” (*regulativ*) and “constitutive” (*konstitutiv*) throughout his critical works; see especially *Critique of Pure Reason*, trans. Norman Kemp Smith (New York: St. Martin’s, 1965), 449–54 (A508–15; B536–43), 514–18 (A615–20; B642–48), 532–49 (A642–68; B670–96); and *Critique of Judgment*, trans. Werner S. Pluhar (Indianapolis, IN: Hackett, 1987), 4–5 (Ak. 167–68), 251–55 (Ak. 372–75), 283–94 (Ak. 401–10). When referring to the *Critique of Pure Reason*, I use the abbreviation *CPR* and note parenthetically the standard German pagination for the “A” and “B” versions of this text; when referring to *Critique of Judgment*, I use the abbreviation *CJ* and note parenthetically, via “Ak.,” the pagination for the standard *Akademie Edition* of Kant’s works. (The *Kritik der Urteilskraft* is in section 1, volume 5 of this edition.) For concise discussions of Kant’s constitutive/regulative distinction, see Friedman, “Regulative and Constitutive”; and Frederick Rauscher, “The Regulative and Constitutive in Kant’s and Hegel’s Theories of History,” *Idealistic Studies* 32, no. 2 (Summer 2002): 121–42.
43. Kant, *CPR* 450 (A509; B537).
44. Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1995), 258. For Kant’s account of the regulative idea of reason in terms of posing “problems,” see *CPR* 449–50 (A508; B536).
45. Hazlitt, *A Reply to the Essay on Population*, 58–59.
46. For Malthus’s invocations of pressure, see 1992: 113, 116, 133, 164.
47. Hannah Arendt, *Lectures on Kant’s Political Philosophy* (Chicago: University of Chicago Press, 1982), 29. On the likely origins for Kant’s distinctive approach to philosophy, see John H. Zammito, *Kant, Herder, and the Birth of Anthropology* (Chicago: University of Chicago Press, 2002).
48. Immanuel Kant, “Idea for a Universal History with a Cosmopolitan Purpose,” trans. H. B. Nisbet, in *Kant: Political Writings*, ed. Hans Siegbert Reiss (Cambridge: Cambridge University Press, 1990), 44.
49. Immanuel Kant, “Perpetual Peace: A Philosophical Sketch,” trans. H. B. Nisbet, in *Kant: Political Writings*, ed. Hans Siegbert Reiss (Cambridge: Cambridge University Press, 1990), 106.
50. Arendt, *Lectures on Kant’s Political Philosophy*, 27.
51. For useful accounts of Kant’s racialized claims about standards of beauty, see Simon Gikandi, *Slavery and the Culture of Taste* (Princeton, NJ: Princeton University Press, 2011), 103–7; Pauline Kleingeld, “Kant’s Second Thoughts on Race,” *Philosophical Quarterly* 57, no. 229 (2007): 573–92; and John Hoffmann, “Kant’s Aesthetic Categories: Race in the *Critique of Judgment*,” *Diacritics* 44, no. 2 (2016): 54–81. Hoffmann provides an especially nuanced reading of this section of Kant’s *Critique of Judgment*, largely because he acknowledges that Kant is divided on the question of race (for example, precisely because Kant “believes that nature intends diversity, he longs to keep races apart”: 73). Following Zerilli’s lead, I stress Kant’s commitment to diversity, rather than Kant’s attempt to keep diversity channeled within purported racial groups. Linda M. G. Zerilli, *A Democratic Theory of Judgment* (Chicago: University of Chicago Press, 2016); Linda M. G. Zerilli, *Feminism and the Abyss of Freedom* (Chicago: University of Chicago Press, 2005).

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), 151–91, 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.

59. Zerilli, *A Democratic Theory of Judgment*, esp. 28–40.

60. Hannah Arendt, *The Human Condition*, 2nd ed. (Chicago: University of Chicago Press, 1998), 57.

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

62. Malthus 1992: 369.

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).

64. Following Lavoisier’s—and, more directly, Claude Bernard’s—lead, the early-twentieth-century physiologist Walter B. Cannon proposed the concept of regulation as the catch-all term for the ability of parts and systems of animal bodies to persist in certain states despite changes in the external environment. See Walter B. Cannon, “The Body Physiologic and the Body Politic,” *Science* 93, no. 2401 (1941): 1–10; Walter B. Cannon, “Organization for Physiological Homeostasis,” *Physiological Reviews* 9, no. 3 (1929): 399–431; and Walter B. Cannon, *The Wisdom of the Body*, 1st ed. (New York: Norton, 1932). My reflections on Cannon and his legacy owe much to Benjamin J. Murphy, “Not So New Materialism: Homeostasis Revisited,” *Configurations* 27, no. 1 (2019): 1–36.

65. Sharon E. Kingsland, *The Evolution of American Ecology, 1890–2000* (Baltimore, MD: Johns Hopkins University Press, 2005), 165.

66. See also Frank B. Golley, *A History of the Ecosystem Concept in Ecology: More Than the Sum of the Parts* (New Haven, CT: Yale University Press, 1993), 24.

67. Kingsland, *The Evolution of American Ecology*, 189. See also Joel B. Hagen, *An Entangled Bank: The Origins of Ecosystem Ecology* (New Brunswick, NJ: Rutgers University Press, 1992), 100–121.

68. Lawrence K. Frank, “Foreword,” *Annals of the New York Academy of Sciences* 50 (1948): 189–96. For discussion of this conference, see Kingsland, *The Evolution of American Ecology*, 186–89.

69. G. Evelyn Hutchinson, “Circular Causal Systems in Ecology,” *Annals of the New York Academy of Sciences* 50 (1948): 221. On Hutchinson, see Hagen, *An Entangled Bank*, 62–76.

70. Kingsland, *The Evolution of American Ecology*, 194.

71. Howard T. Odum, *Environment, Power, and Society* (New York: Wiley-Interscience, 1971). For discussion of Odum’s effort to “root ethics in the laws of energy and the principles of ecology,” see Kingsland, *The Evolution of American Ecology*, 201–3.

72. See esp. Robert Van Horn and Philip Mirowski, “The Rise of the Chicago School of Economics and the Birth of Neoliberalism,” in *The Road from Mont Pèlerin: The Making of the Neoliberal Thought Collective*, ed. Philip Mirowski and Dieter Plehwe (Cambridge, MA: Harvard University Press, 2009), 139–78; Edward Nik-Khah, “George Stigler, the Graduate School of Business, and the Pillars of the Chicago School,” in *Building Chicago Economics: New Perspectives on the History of America’s Most Powerful Economics Program*, ed. Robert Van Horn, Philip Mirowski, and Thomas A. Stapleford (Cambridge: Cambridge University Press, 2011), 116–47; and Edward

Nik-Khah and Robert Van Horn, “Inland Empire: Economics Imperialism as an Imperative of Chicago Neoliberalism,” *Journal of Economic Methodology* 19, no. 3 (2012): 259–82.

73. Nik-Khah and Van Horn, “Inland Empire,” 263–67.

74. See George J. Stigler and Clare Friedland, “What Can Regulators Regulate? The Case of Electricity,” *Journal of Law & Economics* 5 (1962): 1–16.

75. See George J. Stigler, “The Theory of Economic Regulation,” *Bell Journal of Economics and Management Science* 2, no. 1 (1971): 3–21.

76. See, e.g., George J. Stigler, “Regulation: The Confusion of Means and Ends,” in *Regulating New Drugs*, ed. Richard L. Landau (Chicago: University of Chicago Center for Policy Study, 1973), 10–19.

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.

79. The literature on the intersection of enclosure and Romantic aesthetics is vast, but important early discussions include John Barrell, *The Dark Side of the Landscape: The Rural Poor in English Painting, 1730–1840* (Cambridge: Cambridge University Press, 1980); Ann Bermingham, *Landscape and Ideology: The English Rustic Tradition, 1740–1860* (Berkeley: University of California Press, 1986); and Alan Liu, *Wordsworth: The Sense of History* (Stanford, CA: Stanford University Press, 1989).

80. See, for example, The Ecologist, *Whose Common Future? Reclaiming the Commons* (Philadelphia: New Society Publishers, 1993); Michael Hardt and Antonio Negri, *Empire* (Cambridge, MA: Harvard University Press, 2000), 300–3; Michael Hardt and Antonio Negri, *Multitude: War and Democracy in the Age of Empire* (New York: Penguin, 2004), 196–208; and Michael Hardt and Antonio Negri, *Commonwealth* (Cambridge, MA: Harvard University Press, 2009), viii, 120–125, 135–200, 387n11.

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.

82. Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy* (Cambridge, MA: Harvard University Press, 2004), 8.

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.

85. See Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993); Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999); and Latour, *Politics of Nature*.

86. Bruno Latour, "'It's the Development, Stupid!' Or: How to Modernize Modernization," 2007, <http://www.bruno-latour.fr/node/153>, p. 5.

87. On asbestos, see Latour, *Politics of Nature*, 23–24; on air conditioning, see Bruno Latour, *Facing Gaia: Eight Lectures on the New Climatic Regime*, trans. Catherine Porter (Cambridge: Polity, 2017).

88. See Latour, *Politics of Nature*; and Latour, *Facing Gaia*.

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.

90. Bruno Latour discusses his distinction between matters of fact and matters of concern extensively in *Politics of Nature* and provides a brief introduction in "Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern," *Critical Inquiry* 30 (2004): 225–48.

91. Latour, *Politics of Nature*, 8.

92. Latour, *Politics of Nature*, 133.

93. Latour, *Facing Gaia*, esp. 111–45.

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

95. Bruno Latour, "On Some of the Affects of Capitalism," lecture given at the Royal Academy, Copenhagen, February 26, 2014, <http://www.bruno-latour.fr/node/550>, pp. 10–11.

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 Stoff, *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.

100. On Arendt’s critique of the modern sciences, see my “Romanticism and the Experience of Experiment,” *Wordsworth Circle* 46, no. 3 (2015): 132–42.

101. Bruno Latour discusses the relationship of habit and automatism in *An Inquiry into Modes of Existence: An Anthropology of the Moderns*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 2013), 265–80.

102. Latour, *Politics of Nature*, 199.

103. On the Greek polis, see Arendt, *The Human Condition*; on the ward system, councils, and *Räte*, see Hannah Arendt, *On Revolution* (New York: Penguin, 1973), 215–82. For a helpful discussion of the connection between Arendt’s understanding of the connection between local council systems and larger republican and federal units, see Matthew Block, “The Federalism of Hannah Arendt,” MA thesis, Duke University, March 2020.

