Burlesque Natural Philosophers: Eighteenth-Century Satires of Science and Social Innovation

by

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A thesis submitted in conformity with the requirements for the degree of Doctorate of Philosophy

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2017

Abstract

This dissertation examines the socio-political underpinnings of the satires about science that proliferated in British literature from 1660 to 1800. Most scholarship on the topic assumes that frequent literary assaults reflected a prevailing scepticism about science, and this assumption continues to prejudice analyses of satires like The Virtuoso (1676), Blazing World (1668), and the Memoirs of Martinus Scriblerus (pub.1741). However, science was widely embraced as a reliable mode of investigation, and people were generally enthusiastic about it. Why then are there so many farcical natural philosophers in eighteenth century literature and so few respectable ones? I argue that the satirical virtuoso served as a focal point for new forms of social conflict. His zeal for scientific innovation registered broader, often unacknowledged, anxieties about England’s emerging cultural of innovation. Thus, burlesque natural philosophers, who strive to topple traditional hierarchies of knowledge, serve as proxies for the dynamic middle orders, who were seen to threaten traditional social hierarchies.

The dissertation is composed of five case studies focusing on different moments of intersection between science and social hierarchies. The first study is of Margaret Cavendish, whose
fantastical travelogue *Blazing World* and its companion treatise on *Experimental Natural Philosophy* (1668) articulate the perceived link between epistemic and political revolution in a manner that most eighteenth-century satires merely imply. Next I examine Dr. John Woodward, perpetual butt of the Scriblerian group, whose satires fashioned him as an embodiment of social ambition and cultural degeneration. I then discuss three scientific parodies by Henry Fielding and how they reflected the growing presence of science in popular culture. The fourth chapter is on the surprising prevalence of science in oriental tales, and how stories like *Rasselas* (1759) and *Vathek* (1786) used the imaginative east to reflect on prospective technological advances like manned flight and large-scale engineering projects. The final chapter, on Elizabeth Hamilton’s anti-Jacobin novel *Memoirs of Modern Philosophers* (1800), explores the paradox of late-century conservatives who embraced scientific and economic progress, but who continued to regard such progress as threatening traditional social structures.
I am extremely grateful to my mentors at the University of Toronto. My largest debt is to Thomas Keymer who encouraged me through every step of this long process. This dissertation would not have been possible without his boundless knowledge of eighteenth-century literature and invaluable insights into my work, which he shared with unending patience and generosity. I cannot possibly imagine a better supervisor. Thank you also to thank Simon Dickie and Carol Percy who held me to the highest standards in my research and writing, always believing I could achieve them. I owe to you all more than I can express. I would also like to extend my deepest gratitude to Betty Schellenberg at Simon Fraser University for introducing me to joys of the eighteenth century.

It would be nearly impossible to name all of the people who motivated and supported me over the past several years. I am tremendously fortunate for the love and encouragement from my parents, my brother, and my sisters. I thank all of my friends and colleagues who toiled alongside me at libraries and coffee shops, including Thom Bryce McQuinn, Christina Foisy, Isabella Huberman, Nathan Murray, Kate Siklosi, Myka Tucker-Abramson, and Richard Welch, as well as my fellow fellows at the Jackman Institute, Jean Mathieu-Lessard, and Youcef Soufi. And a very special thank you to Adleen Crapo, for her camaraderie, her translations, and especially for helping me with the crocodiles. I would additionally like to thank Caleigh McEachern, John Kerr, Adie Todd, and the rest of Chapman’s Homers, as well as Melissa Auclair, Mike Baker, Luke Lockyer, Santina Macri, Shelley Nixon, Catherine St. John, and, of course, Miyoko Okamoto.

Finally, I would like to acknowledge the generous financial support from the Social Science Research Council of Canada and the Ontario Graduate Scholarship, as well as the unique research opportunities offered to me by the Lewis Walpole Library, and the Jackman Humanities Institute.
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Introduction

Upon entering the University of Ingolstadt, the title character of Mary Shelley’s *Frankenstein* (1818) is rebuked for having wasted his youth studying the antiquated philosophy of Albertus Magnus and Paracelus. His chemistry professor, M. Waldman, proclaims that “the ancient teachers of this science […] promised impossibilities and performed nothing,” whereas, “these [modern] philosophers, whose hands seem only made to dabble in dirt, and their eyes to pour over the microscope or crucible, have indeed performed miracles.”¹ Waldman’s disdain for ancient philosophers, and his valorization of modern experimenters, would have perplexed readers of previous generations. There was almost no precedent in literature for characters to express such beliefs without irony. Henry Fielding’s semi-anonymous contribution to his sister’s *Familiar Letters* (1747) voices a more common sentiment, declaring that “the first great Corrupters of Taste are the Virtuoso’s [sic.…] These are a kind of burlesque natural Philosophers, whose Endeavours are not to discover the Beauties, but the Oddities and Frolicks of Nature.”² Opinions like this are pervasive throughout the century, applied with equal frequency to dilettante amateurs and professional researchers of the Royal Society of London. It may be that Fielding quietly intends to defend certain types of natural philosophy by chastising a particular class of virtuosi, thereby setting the burlesque natural philosophers apart from their nobler counterparts. The passage gives little context, and, as the third chapter of this dissertation argues, Fielding was more sympathetic to experimental science than is generally acknowledged. If this is the case, however, most of his contemporaries would have missed the subtlety. From the so-called scientific revolution of the seventeenth century and into the nineteenth century, men of science were overwhelmingly depicted as bickering pedants, cynical manipulators, doddering cuckolds, sexual predators, suckers and spendthrifts.

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Frankenstein is wholly conventional in its suspicion of science. What sets it apart from earlier literature on the topic, however, is its concern that those philosophers who “dabble in dirt” and “pour over the microscope or crucible” may be growing too potent. Thomas Rowlandson’s caricature Looking at the Comet (Figure 1) offers the much more familiar image of a clueless virtuoso, whose young wife (or ward) encourages his trivial interests, rendering him blind to her sexual indiscretions. This image of an old, impotent, scientist is remarkable in part because Rowlandson etched it in 1811, only a few years before Frankenstein was published, yet the humour would have been current at any point over the previous century and a half. It might easily have been an illustration of Sir Nicholas Gimcrack, the eponymous Virtuoso of Thomas Shadwell’s 1676 comedy of manners, and later focus of this chapter. A curious thing about literary scientists between Gimcrack and Frankenstein is that while science progressed, representations of scientists did not. However, this apparent disjunction, between the reality and reception of science, and representations of scientists in popular culture, becomes less vexing when we recognize that literary scientists did not simply register sceptical attitudes about science. As this dissertation argues, they represented much broader, frequently unarticulated, apprehensions about Britain’s culture of innovation, which became dominant over the eighteenth century. Whereas Frankenstein really did speak to concerns about the potential dangers of scientific productions, Gimcrack and his ilk spoke to concerns that the nation’s zeal for progress might endanger social cohesion and political stability.

There is a striking disconnect between the increasingly positive attitudes towards science throughout the eighteenth century, and the overwhelmingly negative portrayals of science in literature over the same period. Even before the Restoration era—which saw the institutionalization of science with the Royal Society charter (1662) and those of its European counterparts like the Parisian Académie des sciences (1666)—experimental science was establishing itself as an authoritative mode of gathering and evaluating knowledge, and it would only grow in influence. Scientists of the late seventeenth century were radically reimagining how

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3 “Science” and its variants are problematic terms in an eighteenth-century context. As will be discussed, however, they are necessary anachronisms for this project.

to best understand nature, and mankind’s place within it. Beginning around 1660, Robert Boyle’s celebrated air-pump experiments provided “a heuristic model of how authentic scientific knowledge should be secured.” At around the same time, Isaac Newton was being venerated for books like *Philosophiæ Naturalis Principia Mathematica* (1687), which formulated the universal laws of motion and gravitation. Though the post-Newtonian era was long regarded as “a tiresome trough” between “the peaks of the seventeenth and those of the nineteenth century,” science actually continued to expand in scope and influence. It was, in fact, so highly esteemed in the eighteenth century that it transcended national and political boundaries, as evidenced by Charles de la Condamine’s massive scientific expedition of 1735, jointly funded by the governments of England, France, and Spain, despite the countries’ ongoing military and colonial conflicts. Carl Linnaeus’s *Systema Naturae* (1734) introduced a taxonomical model based upon sexual morphology, which was “adopted by virtually every university naturalist in the second half of the century.” Not only did Linneaus contribute “mammal” and “homo-sapiens” to the English lexicon, but his hierarchical classification by gender and rationality helped give rise to an era of “scientific sexism” and “scientific racism,” which reverberated throughout the colonial era. Nor was the impact of science limited to grand ideological shifts. Practical inventions like the seed drill (1701), the mercury thermometer (1724), the marine chronometer (1761), the spinning jenny (1764), the steam engine (1769), and the preserving jar (1795) were recognized as revolutionizing agriculture, transportation, and industrial production. As Roy Porter writes, “wherever one looks, there was, during the eighteenth century, no stalling in scientific theory or

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practice, no shortage of what (depending on which philosophies or sociologies of science we adopt) we can call the ‘discovery,’ ‘invention,’ or ‘construction’ of new knowledge.’"^10 There was, throughout the period, a general sense that Britain was being improved by what Tobias Smollett lauds as “the advances which mankind are daily making in useful knowledge, and detached labours of the ingenious.”^11 Why then was eighteenth-century literature so hostile to scientists?

Most scholarship on the interplay between science and literature has focused on shifting paradigms for conceiving and representing the natural world. George S. Rousseau traces the evolution of empiricism and scientific objectivity in writers like Fielding and Sterne through the “dozens of full-length fictions” in the 1790’s, which “adumbrated the truths of the human head and heart in strategies fundamentally similar to those of scientists generating theories about physics or geology.”^12 He concedes that “the Tory satirists, Swift and Pope” were generally sceptical about their culture’s “belief in [scientific] progress and national power,” the correlation of which, Rousseau claims, was “the true Newtonian legacy.”^13 However, he does not comment upon the utter lack of respectable scientists in English literature between 1660 and 1800. The only possible exception may be found among female virtuosi of the restoration stage, such as Valeria of *The Basset Table* (1705), whose enthusiasm for science is merely portrayed as a personality quirk, which she overcomes in order to fulfill the marriage plot.^14 Yet, it is not until the nineteenth century that we regularly find scientists like Dr. X, of Maria Edgeworth’s novel

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13 Rousseau, 774.

Belinda (1801), whom the narrator describes as “a sensible man, who has knowledge of the world, and talents for conversation.”

Though substantial work has been done on popular resistance to science in the seventeenth and eighteenth centuries, most of it has been limited to issues of epistemology and moral philosophy. Michael Hunter’s authoritative study of Science and Society in Restoration England asserts that satirical attacks on science were manifestations of a much older conflict between rhetoric and philosophy, refigured in the early modern period as a debate between ancient and modern learning. The main point of contention, he argues, was whether it was “more important to cultivate virtue and eloquence, or to pursue accurate knowledge of the natural world and the human past.” Accordingly, “fashionable attacks on science” reflected “humanist ideals,” which placed “virtue rather than practicality as the proper end of education.” Barbara Benedict’s more recent genealogy, Curiosity, similarly attributes literary assaults on science to “the moral charge that science undermine[d] traditional values.” While Benedict’s study is useful in many respects, it remains unclear as to how these value systems would have been at odds with each other, and instead presumes a mutual antagonism between “classical and scientific values.” Yet, detailed examinations of eminent “humanists”, like Alexander Pope and Jonathan Swift, invariably conclude that they were not quite as hostile to science as has traditionally been assumed. Not only do such studies invariably dispel the mythical binary of science and humanism, but they demonstrate that mainstream theories of morality and aesthetics were intertwined with scientific theories.


17 Hunter, Science and Society, 160.


19 Benedict, 49.

A small number of scholars have asserted that men and women of letters resisted science because they recognized its destructive potential. For them, the scientist was a Faustian figure, driven by a malignant desire “to transcend human limitations and aspire to the wisdom of God.” But while the late eighteenth century saw a few stories, like William Beckford’s oriental tale *Vathek* (1786), in which the title character’s appetite for knowledge brings about death and damnation, such instances are far too rare to suggest this was a widespread concern. Neither did any major religious sect of the seventeenth or eighteenth century denounce sciences as impious or morally threatening. Other scholars have pointed to Jonathan Swift as a moralist who foresaw the catastrophic implications of militarized science. Much has been made of the episode of *Gulliver’s Travels*, wherein the king of Brobdingnag recoils at Gulliver’s proffered gift of gunpowder. However, this line of argument rests on the uncertain premise that Swift or his readers would have placed gunpowder as a scientific invention, despite the fact that it was a commonplace technology in Europe long before Swift was born, and that nowhere else is it a standard points of attack on Restoration or eighteenth-century science.

How can we explain the proliferation of literary attacks upon science without assuming epistemological binaries between science and humanism, or apprehensions about science’s destructive potential? We can begin by reconsidering the basic premise of these unsatisfying assertions: that scientific satires were primarily meant to critique an emerging epistemological mode. This assumption does not follow necessarily from the evidence. Few, if any, eighteenth-century satires challenge experimental methodology. They rather emphasize the peculiar characteristics of the scientific practitioner. Moreover, features of the burlesque natural philosopher are remarkably consistent from the Restoration throughout the eighteenth century, and barely respond to advances in knowledge, or changes in the way that publics understood and


22 The fourth chapter of this dissertation argues that *Vathek*’s moral is less Faustian than has been supposed.


interacted with science. This unexpected stability implies that the scientist is meant to denote a stable character type, and not a dynamic field of research. Thus, a more plausible explanation for these attacks reveals itself in the particularities of this character type. As will be discussed, the parodic scientist is a figure of social instability, heavily inflected with tropes of shifting class structures. Burlesque depictions of scientists are less concerned with critiquing experimentalism, than with correcting those who would ignore the proper social order, or worse, refute its natural basis.

Historians of science have long acknowledged the fact that challenges to the experimental method often obscured larger social conflicts. Steven Shapin and Simon Schaffer’s monumental book, *Leviathan and the Air-Pump*, approaches Restoration-era debates over “scientific truth” as mainly social competitions, rather than epistemological. As Shapin and Schaffer argue, Robert Boyle pioneered the “experimental method” to meliorate the factionalism of the Civil War and Interregnum periods. Political turmoil of the seventeenth century had seen “‘enthusiasts,’ hermeticists and sectaries” erode traditional hierarchies of social authority, along with “the credibility of any existing institutionalized conventions for generating valid knowledge.”

Boyle’s conciliatory method avoided *ad hominem* debate, instead proposing experimentation as a means of challenging assertions of fact without having to challenge the asserters. Ironically, Boylean experimentation, which had been intended to reunify, and re-establish traditional hierarchies of knowledge, had the opposite effect. It encouraged the democratization of knowledge and the dissemination of authority. One’s hereditary station no longer underwrote the credibility of his truth claim. Opponents of the experimental method quickly recognized the political implications of Boyle’s epistemological method, and challenged it accordingly.

Hobbes’s *Dialogus physicus* (1661) refutes the scientists of Gresham College (who would soon form the Royal Society) by attacking their social credibility. *Dialogus* repeatedly links experimental philosophers to the low artisans and tradesmen upon whose labour science

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26 Shapin, Schaffer, 73.
depended. He even charges the scientists of Gresham with displaying their “trifling wonders,” in the manner of those “who deal in exotic animals, which are not to be seen without payment.” Thus Hobbes is one of the first to criticize science by implicating its practices and productions in the labour and commodity markets. Such implications would continue to inform the burlesque scientists of literature, who, as we shall see, embodied the crass materialism of the commercial classes.

1. Eighteenth-Century “Science”: A Case for Anachronism

There is no perfect vocabulary with which to discuss the empirical practices of eighteenth-century experimenters and natural philosophers. However, out of necessity, and in the interest of foregrounding the social implications of experimental philosophy, this dissertation cautiously adopts the semi-anachronistic term “science”, a category that is both methodological and ideological. It is founded on the epistemology of empiricism, which is characterized by its rejection of the idea “that we have any concepts, beliefs or knowledge,” or “that we may obtain substantial knowledge of the world, or of ourselves, a priori.” Not identical to “empiricism”, “science” is rather the investigatory branch of a philosophical proposition. However, it is hardly possible to discuss one concept without reference to the other. As this dissertation argues, popular satires of science were never so much affronts to science itself as they were to the empirical world-view; or, more particularly, how the empirical world-view seemed to corrode social hierarchies. Thus, this dissertation employs “science” and “empiricism” interchangeably, and, despite meaningful objections by historians, interchangeably with various synonyms, or near-synonyms, preferred in the past.

27 Shapin Schaffer, 143.


For most historians today, the anachronistic use of “science” is a mortal methodological sin; however, for a few, it is merely venial. While the term “science” was available, experimenters and their critics favoured terms like “experimental philosophy,” “natural philosophy,” “naturalism,” and the like. To refer to the practices of the early Royal Society as “science” presumes such practices were more homogenous than they actually were, and it is to gloss over the numerous sub-disciplines that are no longer recognized as scientific—such as alchemy, antiquary studies, and natural theology—but that were once considered siblings of chemistry, physics, and mathematics. More problematic still, the backwards application of “science” risks naturalizing a contemporary set of methodologies, and implying that the contingent set of theories and practices that we now think of as science has always been a coherent discipline just waiting to be chiselled out of the marble of history. For reasons such as these, orthodox historians eschew the language of “science” when referring to early experimental practices, often citing Quentin Skinner’s still influential article, “Meaning and Understanding in the History of Ideas,” which denounces retrospective categories for imposing false coherences, “which it becomes the duty of [the] interpreter to reveal.”

The article spurred an emphatic debate among historians, which culminated in a new methodological standard of rigorous adherence with the terminology of the day.

While Skinner broadly opposes any diachronic history of ideas, Andrew Cunningham makes the persuasive, now standard, claim that “science” is uniquely unsuitable to describe experimental practices of the seventeenth and eighteenth centuries. As he argues, histories of science can only study intentional activities, and since the modern parameters of science would not be demarcated until well after the eighteenth century, early experimenters did not practice science in any recognizable sense of the word. The post facto use of “science” creates insuperable barriers to understanding what early experimenters believed themselves to be practicing, since the retrospective term fundamentally “misrepresent[s] the identity of the subject whose history we claim to be studying.” A key hazard of this way of thinking, according to Cunningham, is that


it reifies the concept of science as a thing, and encourages us to forget that it is a particular set of historically contingent human activities. Where more scrupulous language spurs better understandings of the historical circumstances of people and their practices, proleptic terminology flatters our existing biases “because it matches the way of conceptualising that brought us into the subject in the first place.”\(^{32}\) To this we might add the risk that the contemporary designation of “science” seems to imply a Whig interpretation of history, wherein a small group of free thinkers triumphed over conservative inertia to the technological betterment of humanity.\(^{33}\) Historians in the latter half of the twentieth century successfully campaigned against the naturalization of such progressive narratives, resulting in a broad consensus among historians that “science” is too inaccurate and prejudicial a term to appropriately describe early experimental practices.

But while the arguments raised by Skinner and Cunningham remain compelling, as attested by their canonicity in the discipline of history, the problem remains of how to discuss the significant methodological-epistemological shift of the late seventeenth century, which was characterized by a plurality of practices for which there was a surfeit of terms. Compounding this problem is the fact that these terms were frequently employed as ideological markers, but just as frequently employed as mere synonyms. For instance, Margaret Cavendish deliberately uses “experimental philosophy” to express disdain for the low materiality of Royal Society research; whereas Thomas Sprat’s *History of the Royal Society* (1667) uses “experimental philosophy” and “natural philosophy” interchangeably, presumably out of an aesthetic aversion to repetition. The terminological morass has prompted some historians to adopt a cautiously inclusive attitude towards anachronisms of convenience. For instance, Nick Jardine, no great champion of linguistic revisionism, concedes that “unfaithfulness to the categories of past agents does not always constitute vicious anachronism,” provided that scholars “attend properly to the material,

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\(^{32}\) Cunningham, 317.

\(^{33}\) H. Butterfield, *The Whig Interpretation of History* (New York: Norton, 1965), challenges the notion that historical progress is the same as political improvement. Butterfield’s sweeping denunciation of “studies of the past with reference to the present” continues to inform conversations on the place of anachronism in the history of ideas (11).
psychological, social and institutional conditions of the productions of deeds and works.”

It is with this holistic approach in mind that this dissertation employs “science”, alongside various synonyms, appropriate to the chronology of the particular chapter and the tone with which they were intended.

In addition to providing an alternative to the cumbersome, and frequently ill-defined, terminology of the seventeenth and eighteenth centuries, the choice to refer to natural philosophy and its kin as “science” recognizes a practical and ideological consistency between the research of early and modern scientists. When Cunningham and his adherents reject the use of “science” in the context of eighteenth-century empiricism, they do so under the assumptions that there is now a coherent meaning, that this meaning was unavailable to seventeenth- and eighteenth-century experimenters, and that the material practices of the early Royal Society would not fit easily into modern definitions of the word. Yet none of these assumptions are impervious to dispute. Today, we generally regard the boundaries of science as more or less settled. However, even the most authoritative definitions of the term are deceptively porous and impressionistic, leading sceptical historians, like Steven Shapin, to contend that “science” has never referred to a coherent and distinctive set of practices. The United Kingdom’s Science Council, for instance, offers a functional definition of science as “the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence.” But then, what academic discipline does not seek to learn about nature (whatever that means) and society by way of “a systematic methodology based on evidence”? Such imprecision is not a terminological weakness, but a categorical necessity, acknowledging the paradigmatic instability of “science”, and the fluidity with which investigative practices move in and out of its purview.


Thomas Kuhn’s study on *The Structure of Scientific Revolutions* (1962), the first major work to acknowledge the instability of scientific paradigms, asserts that there is always an “arbitrary element” to “science.”\(^\text{37}\) Such arbitrariness is “compounded of personal and historical accident,” but does not preclude us from recognizing the productions of anterior paradigms as “scientific.”\(^\text{38}\) And while many, perhaps most, early Royal Society experiments would fail to live up to modern standards of verification, the “Defence and Recommendation of experimental Knowledge” outlined in Sprat’s *History* proposes nothing radically out of line with the above definition.\(^\text{39}\) Though primitive in execution, the types of empirical research in which the Royal Society engaged map very neatly onto modern conceptions of science, as Peter Medawar observes when he likens early experimenters to “the chap in Moliere who found that all his life, unknowingly, he had been speaking prose.”\(^\text{40}\) We may thus answer Cunningham’s objection that early practitioners did not do “science”, by noting that there has never been a strict consensus on what it means to do “science”, but that early Royal Society practices correspond with many modern definitions.

However, the similarities between early and modern science exceed practical issues of epistemology and methodology. In the eighteenth century, as now, the category of “science” carried considerable ideological weight. The stakes of whether to employ the semi-anachronistic term “science” to describe early experimentalism go beyond issues of linguistic convenience. The very fact that “eighteenth-century science” is such a contested phrase, speaks to the fact that experimentation was, for so long, considered a socially marginal practice. Members of the early Royal Society certainly regarded their practices as “science”, and campaigned to establish experimental philosophy within that realm, but they were impeded, often deliberately, by cultural conservatives. Sprat’s *History* repeatedly seeks to collapse the binary between mechanical arts


\(^{\text{38}}\) Kuhn, 4.


and philosophical sciences by demonstrating how practical experimentation can inform philosophical rationality. At his most ambitious, he even attempts to elevate experimentation above privileged modes of “science”, such as disputational philosophy, which he claims “can never much augment the solid substance of Science itself.”\footnote{Sprat, 18.} Despite such efforts, however, the Society was plainly unable to settle their epistemology within discourses of “science”. Had they enough social authority to define their own practices, modern scholars would be unencumbered by the terminological glut of the proceeding century, but science could only become “science” once it had intertwined itself with dominant social ideologies.

For all of its enduring relevance, a significant portion of Cunningham’s argument rests on the shaky premise that the anachronistic language of “science” necessarily “takes[s] for granted that science is special—rather than asking how and why people in the past […] came to see it as special.”\footnote{Cunningham, 368.} However, seventeenth- and eighteenth-century Britons clearly regarded experimental science as something special, though not necessarily in a good way. The specialness of empirical science lay partially in its promise to better mankind through the improvement of knowledge—as Sprat’s History insists—but partially in its project of upending traditional hierarchies of knowledge. Epistemological upheavals of this magnitude cannot occur without social agitation. This is not to suggest a simple cause and effect relationship, as Kuhn does when he asserts that a paradigm shift must necessarily result in “transformation of the world within which scientific work [is] done.”\footnote{Kuhn, 6.} Social structures and structures of knowledge are equally determining of each other, but it is easy to miss the reciprocal nature of this relationship. The rapidity with which Shadwell fitted experimenters with an original repertoire of satirical tropes, and the readiness with which popular culture adopted Nicholas Gimcrack as the very model of scientific folly, attests to the fact that science was immediately regarded as “special”, to borrow Cunningham’s word, while the tropes themselves speak to the social anxieties that science provoked.

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2. Gimcrack’s Influence

No single author contributed more to popular images of the scientist than Shadwell. Now best remembered as heir to the Throne of Dullness in John Dryden’s mock-panegyric, *Mac Flecknoe* (1684), Shadwell is less frequently acknowledged for his considerable influence upon how the English envisioned science and scientists.\(^4^4\) The “rare mechanic philosopher” and “curious coxcomb” Gimcrack is fascinated by natural curiosities and frivolous experimentation (2.2, 303). He studies swimming in his laboratory by imitating the kicks of a frog, and passes days “whole days” staring at a “small black speck” on the “anus, or fundament” of an ant (2.2, 1-24; 3.3, 13-20). *The Virtuoso* was an immediate success. Its initial run earned Shadwell a rare second benefit performance.\(^4^5\) It was restaged regularly into the eighteenth century, and according to Charles Gildon’s 1699 account, the play “always found Success.”\(^4^6\) But *The Virtuoso* had cultural resonance far beyond the immediacy of its productions. It created a character type through which the public could conceive scientific practices and practitioners. The play’s impact was soon felt by Royal Society members, especially Royal Society Curator, Robert Hooke, who complained that Gimcrack was fashioned after him. Hooke recounts his unpleasant experience attending the play, writing in his diary, “Damned Doggs. Vindicia me Deus. People almost pointed at me.”\(^4^7\) The association between Gimcrack and science was so strong that in his revised *Reflections upon Ancient and Modern Learning* (1705), William Wotton felt compelled to assure his reader that not “every Man whom they call a *Virtuoso*, must needs be a *Sir Nicolas Grimcrack*.”\(^4^8\) Few, it seems, were moved by Wotton’s appeal.


For many decades, “Gimcrack” was a byword for someone who wasted his time and money on frolicsome studies, while at once pretending to great learning and high social esteem. Gimcrack is a figure of curiosity, though not in the free-thinking sense we value today, but rather in the sense of that which is curious to others, or worse, that which is “marked of a threatening ambition.”

At its most benign, Gimcrack’s is the idle curiosity of a daydreamer or gossip, as invoked by the character Artander in an anonymous Collection of *Familiar Letters* from 1720. Reproving himself for his interests in “the innocent Diversions of Town,” Artander proclaims, “Curiosity only makes the Vertuoso; and if I go on a little longer, I shall grow a perfect Sir Nicholas Gimcrack.”

Most references, however, involve more than harmless gossip. They hint at a kind of social revolt, in which scientific investigation is tantamount to an assault on traditional structures of understanding. For instance, Antoine Furetière’s satire *The Rebellion* (1704) stages a civil war between Princess Rhetoric and the would-be usurper Prince Bombast. Predictably, Bombast is supported by the Royal Society who provide an artillery division, “at the head of [which], marched the worthy Gimcrack, adorned with many a far-fetch’d Rarity.”

The association between Gimcrack and false learning can be seen as late as 1793, wherein John Aikin’s didactic dialogues, *Evenings at Home*, draw upon an enduring familiarity with Shadwell’s character. Referring to the memorable scene wherein Gimcrack attempts to learn to swim by flailing on a table in imitation of a frog, a father warns his son not to approach learning “as Sir Nicholas Gimcrack did”; and, in a convoluted analogy explains that “Learning to swim with corks, is like learning to construe Latin with a translation on the other side. It saves some pains at first, but the business is not done half so effectually.”

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49 Benedict, 2.


While Gimcrack’s longevity speaks to Shadwell’s often overlooked talent as a playwright, the character’s influence was only possible in a society that was equally enthusiastic about the wonders promised by the new sciences, and apprehensive about their implications. But what were these implications? Critics and scholars have traditionally approached *The Virtuoso* as a pointed attack on scientific epistemology. As one argues, the play proved to be “the period’s most brilliant formal intervention in intellectual and ideological crises surrounding the new sciences.” Shadwell “short-circuited” the Society’s efforts to legitimize their epistemology of observation and demonstration, by showing experiments to be “little more than a species of drama.” Another echoes this line of criticism in asserting that Gimcrack’s vacant rhetoric, and that of his loquacious flatterer, Sir Formal, intends to challenge the Royal Society’s “epistemology of certainty through controlled observation.” Joseph Gilde stands alone among twentieth-century scholars in arguing that the “primary target of the satire in *The Virtuoso* is not [...] the experimental scientists of the Royal Society.” Cataloguing the discrepancies between Gimcrack’s scientific pretensions, and legitimate experimental practices, Gilde asserts that “Shadwell was in general accord with the principles of the Royal Society.” Moreover, he notes, *The Virtuoso* makes efforts to distance the Royal Society from Gimcrack’s foolish experiments, reminding us that “[Gresham] College refus’d him” entry (2.1. 304)—though he opts not to cite the more emphatic declaration that Gimcrack is “despis’d” at Gresham (5.6. 17). Gilde’s radical reconsideration of the play seldom receives more than perfunctory acknowledgment these days, possibly because audiences have never seemed to notice the gap between Gimcrack’s studies and those of the Royal Society.

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54 Shanahan, 549.


57 Gilde, 470.

58 Gilde, 471.
Yet the play is entirely legible as a conflict between generational values, and a study of what kind of man could best re-stabilize England’s civil society after the Restoration of Charles II. Paradoxically, *The Virtuoso* positions science as a proxy for an antiquated generation’s refusal to cede authority to an emerging one. Shadwell enacts this struggle through a variation of the cuckold plot, and resolves it through the sexual triumph of two young gallants, Bruce and Longvil. The pair infiltrate Gimcrack’s country manor and successfully court his nieces, Miranda and Clarinda. Thus the order is symbolically infused with a youthful vitality, and restructured around pre-Revolutionary, aristocratic, values. Tita Chico partially vindicates Gilde in asserting that Shadwell bound Gimcrack’s science to pre-existing concerns about the commercial classes. As she notes, Restoration audiences were closely attuned to the “growing marketplace for optical and other scientific instruments.” Ultimately, she argues, science in *The Virtuoso* represents “the simultaneous depletion” of reproductive opportunities for, and the “personal wealth” of, the traditional hierarchy. However, Shadwell does not universally condemn science. Rather, he upholds an impossible culture that embraces science’s innovative knowledge, but rejects social innovation.

The protagonists Bruce and Longvil are to an extent hybrid figures of modern learning and classical values. The play opens with Bruce reciting from Lucretius’s first-century poem, *De Rerum Natura* [On the nature of things]. To which Longvil replies, with an irony that invites the audience in on the joke, “my noble Epicurean, what an unfashionable fellow art though, that in this age art given to understand Latin” (1.1. 10). Benedict reads this as the play’s opening gambit, claiming that Shadwell offers the venerated Epicurean poem, “emblematic for its traditional wisdom,” as a standard against which to judge Gimcrack’s degenerate philosophy. This reading is plausible to an extent; however, it overlooks the particular significance of *De Rerum*, treating it as more or less interchangeable with any classical text. In fact, Lucretius became significant to natural philosophy during the Interregnum period, where, according to

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60 Chico, 32.

61 Benedict, 48.
Jonathan Kramnick, it “reviv[ed] [and] shaped the ongoing debate between the dualism of official Christianity and the monism of Hobbes and other materialists.” Lucretius was widely discussed, in the salons of Paris, among the cultural and philosophical elites who would popularize science during the Restoration era, people like René Descartes, Thomas Hobbes, and Henry More. De Rerum’s materialist thesis—all that exists is autonomous matter—was championed by early mechanical philosophers, including Margaret Cavendish, who eventually became uncomfortable with the anarchical connotations of self-determined atoms.

For many, “Epicurean” was a pejorative term to describe radical free thinkers who, in the words of Cavendish, “endeavour to prove matter to be somewhat like God, [and] endeavour to prove man to be somewhat like God.” When Longvil refers to his companion as a “noble Epicurean,” then, he is gesturing towards a topical debate over the political implications of science. The first lines of The Virtuoso come close to aligning the protagonists with a socially disruptive mode of modern philosophy. However, Shadwell carefully forestalls this association by opening on Bruce reciting a quotation that extolls perpetual harmony under the divine monarch: “omnis enim per se divum natura nescet/ immortali aeo summa cum pace fruatur” (“The Gods, by right of Nature, must possess/ An everlasting Age of perfect peace” (1.1. 9). By invoking a poem so closely associated with mechanical philosophy, Bruce and Longvil demonstrate a respect for, and aptitude with, modern thinking. However, by cherry-picking a passage that does not refer to atomism, and by extension current debates about its political implications, they claim the status of natural gentlemen. Thus the play suggests the nation’s stability is best ensured by those who can bring modern science in line with ancient political structures.

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3. “This Watery Science”: Dissolving Natural Hierarchies

Shadwell may seem an unlikely champion of monarchical hierarchies. He was, as Kate Bennett describes him, a “leading writer of the Whigs,” a party of trade whose raison d’être during the late seventeenth century was to limit monarchical power. Moreover, as a member of the Green Ribbon Club, Shadwell served as a propagandist against the reigning Charles II. Shadwell’s boldest political work, *The Lancashire Witches* (1681), was heavily censored before it reached the stage, due to its crass anti-Catholic content. Despite the obvious political dangers, he published a full version the next year, with previously redacted passages reintroduced in italics. The consequences of this affront to the Catholic monarch were swift and severe, and Shadwell was unable to publish again until after the Glorious Revolution of 1688. How then, do we reconcile his political dissent with, as will be discussed, *The Virtuoso’s* strong defense of the monarchical order, and somewhat sympathetic attitude towards Charles II?

The simplest explanation relates to his personal and financial relationships. One of Shadwell’s earliest, and most generous, patrons was William Cavendish, Duke of Newcastle. Cavendish had fought for Charles I during the Civil Wars at great personal expense, and followed his deposed king to France during the Interregnum. While in exile, William, then Marquis of Newcastle, remained close to the king and his family, tutoring the young Charles in equestrian and military matters. A few years after his restoration, Charles II granted Cavendish the rank of Duke in reward for his services, and William remained loyal to the Stuart monarchy until his death in 1676. William never publicly expressed an opinion as to the utility or political implications of the new sciences. As the next chapter discusses, however, his wife, Margaret Cavendish, was a vocal opponent of the experimental philosophy in general, and the Royal Society in particular. Shadwell must certainly have known of Margaret’s animosity towards the Society. Even in the unlikely case that she never expressed her views in person, he owned copies of all her anti-scientific writing. The epistle to his comedy, *The Humorists* (1671), which he dedicated to her, notes that the Duke had previously given him a present of “all [her] excellent Books,” which

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would have included her polemics against the Society. No doubt, Margaret would have approved of Shadwell’s treatment of science, and he may well have dedicated *The Virtuoso* to her had she been alive when he wrote it. Instead, he dedicates it to William, while paying an oblique tribute to Margaret in the prefatory epistle, which offers *The Virtuoso* as a thematic successor to *The Humorists*, and refers back to its preface, Shadwell’s only published address to her (4). Thus, *The Virtuoso*’s scepticism towards the politics of science may intend to honour his friends and patrons by mirroring their own political attitudes, and, at least, Margaret’s attitudes towards science.

Yet, even if we disregard *The Virtuoso*’s close ties to the Newcastles, we need not find the play’s conservatism out of line with Shadwell’s Whig politics. Cultural reverence for Dryden, and the lasting influence of *Mac Flecknoe*, has resulted in a popular image of Shadwell as an enemy to monarchical stability. However, there is nothing in Shadwell’s corpus to suggest he opposed hereditary government. To the contrary, his political activism—which seems to have begun in earnest sometime after he wrote *The Virtuoso*—stemmed from his conviction that the French government and Italian Church were exerting undue influence on the English Crown. A special issue of the journal *Restoration*, which reconsiders the life and works of Shadwell, features several articles which all concur he championed a home-grown Protestant monarchy. While he agitated against tyranny, he supported a blended system, which remained predicated on a system of hereditary ranks and rule. He was, as one scholar writes, “a dynamic supporter of […] the institutions of monarch and parliament.” And as another notes, Shadwell’s prefaces and dedications show a consistent and “sincere respect for the aristocratic system.” While the seditious *Lancashire Witches* opposes the Catholic monarch Charles II, the play hearkens back to


67 According to Kirk Combe, “Considering Shadwell,” *Restoration* 20.2 (1996): 88-100, 91, it was only in 1679 that Shadwell “waded into the larger political furor of the times.”


“the golden Days of Queen Elizabeth.”70 As Jessica Munns writes, this nostalgic invocation appealed to a “tradition that the Whigs invented and that Shadwell embodies in this play articulates a powerful sense of national identity,” which embraces “People’s Liberties” and “Prince’s Rights.”71 Crucially, the Tory-Whig divide of the late seventeenth century was not a contest between pro- and anti-monarchists, but rather a contest over the best type of monarchy. As the continuing influence of the Gimcrack character attests, apprehensions relating to science transcended political affiliations. Burlesque natural philosophers embodied deeper concerns about the ethos of progress, which seemed to threaten the hereditary foundations of English society.

As Al Coppola notes, Gimcrack espouses no particular political loyalties, but his scientific interests align him with a new generation of “modish upstarts who are busy overturning the established order of home and nation.”72 Gimcrack is technically of noble stock, though he has little interest in his family estate beyond strip-mining it for whatever money he can devote to his experiments. Yet despite his title, Gimcrack’s science is geared towards destabilizing traditional hierarchies. His experiments are not, however, destabilizing as a result of any industrial advances they might bring. In fact he takes great pride in the fruitlessness of his life’s work, boasting “I seldom bring anything to use; ’tis not my way. Knowledge is my ultimate end” (2.2.85-86). Rather, his obsession with all forms of transmutation makes him socially destabilizing. Gimcrack may eschew purposeful science, but beginning with his theoretical swimming lesson, Shadwell insinuates that the goal of all experimental philosophy is to dissolve natural categories. The scene rises on Gimcrack sprawled on a table clutching a packthread in his teeth, which is bound to the loins of a frog in a nearby bowl of water. Gimcrack thrashes and kicks in imitation of the amphibian, while a swimming master scrutinizes his form, and the sycophant Formal gushes “I doubt not, sir, but in a short space of time you will arrive at that curiosity in this watery science


that not a frog breathing will exceed you” (2.2. 1-3). Shadwell intends the periphrastic “watery science” as a double affront to Formal and Gimcrack. It mocks Formal’s pretentious oration, and at the same time it suggests that Gimcrack’s entire project of experimentation is a kind of “watery” endeavour, lacking a firm rational foundation. Yet, the phrase carries a further metaphorical significance, which Shadwell may not have intended, but which neatly captures The Virtuoso’s criticism of science. From expanding mankind’s earthly dominion, to alchemical transmutation, to altering the nature of animals and people through blood transfusion, Gimcrack is utterly preoccupied with liquefying natural boundaries.

The undiscriminating character of The Virtuoso’s science permits Shadwell to parody all major branches of natural philosophy, implying that all share Gimcrack’s passion for dissolution. Gimcrack’s enthusiasm for anatomy provokes laughter at the grotesque animal experiments of Boyle and Hooke, as Gimcrack gleefully recounts cutting into the carotid arteries and jugular veins of a “mangy spaniel” and a “sound bulldog” for the purpose of transfusing their blood. His swimming experiment recalls ambitious projectors who sought to claim dominion over the air and sea through newfangled technologies, a comparison Gimcrack invites in his declaration that “a man by art may appropriate any element to himself” (2.2. 28-29). Later in the same scene, he draws a direct comparison to John Wilkins’s sensational book Mathematical Magick (1640), which inspired mechanical projectors of the Restoration era with its visions of flying machines and submersible vessels. Gimcrack declares “a great many virtuosos […] can fly, but I am so much advanc’d in the art of flying that I can already outfly that ponderous animal call’d a bustard” (2.2. 29-31). He then makes the even more grandiose claim that “in a little time […] ’twill be as common to buy a pair of wings to the world in the moon as to buy a pair of wax boots to ride into Sussex with” (2.2. 33-36). This, in turn, occasions satire of astronomers, who, since the days of Galileo, had been charting maps of celestial bodies, and envisioning ways in which men might be able to navigate them. So too has Gimcrack has spent twenty years “compiling a book of geography for the world in the moon” (2.1. 243). Shadwell derives every aspect of Gimcrack’s science from actual theories and experiments posited and performed by reputable natural
philosophers—or, as reputable as natural philosophers could be. Pastiche of this sort quickly became the dominant mode of scientific satire, and remained so for several decades. Yet, Shadwell intends more with Gimcrack’s dilettante philosophy than a broad mockery of science. These seemingly disparate studies are united by a common desire to transverse boundaries, as seen most clearly in Gimcrack’s experiments at altering the fundamental natures of living creatures.

The study of physiology via animal experimentation was a major pillar of the new sciences, and an obvious point of attack for those alleging scientific hubris. The Royal Society was instantly notorious for its outlandish anatomical demonstrations, asphyxiating and vivisecting animals on the Gresham College stage. As the eighteenth century progressed, such experiments drew moral objections from writers like Samuel Johnson who denounced “[those] wretches, whose lives are only varied by varieties of cruelty; whose favourite amusement is to nail dogs to tables and open them alive” (Idler 17.5, Aug 1758). Similarly, Anna Barbauld’s sentimental poem, “The Mouse’s Petition [to Dr. Priestley]” (1773), appeals to universal Christian compassion, warning against the gratuitous killing of animals, “lest in the worm you crush,/A brother's soul you find.” However, the Society’s earliest detractors affected little sympathy towards animal subjects, and rather upheld these callous experiments as emphatic proof of scientific frivolity. The anonymous “Ballad of Gresham Colledge” (c1662), which recounts experiments performed for the amusement of a visiting dignitary, critiques the triviality of Boyle’s air pump, while offering little sympathy for the cat suffocated by the machine:

To the Danish Agent late was showne

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73 For a comprehensive account of the specific experiments satirized in Shadwell, see Claude Lloyd, “Shadwell and the Virtuosi,” PMLA 44.2 (1929): 472-494.


That where noe Ayre is, there's noe breath.

A glasse this secret did make knowne

Where[in] a Catt was put to death.

Out of the glasse the Ayre being screwed,

Pusse dyed and ne're so much as mewed.\(^{77}\)

Rather than calling attention to the animal’s unnecessary suffering, as Barbauld would do a century later, the “Ballad” emphasizes the grand pointlessness of the experiment. A cat is sacrificed in order to disclose some “secret” of nature, but dies silently, having revealed only that which was already known, “where noe Ayre is, there’s noe breath.” While offering no insights into the natural world, spectacles of this sort appeared to reveal much of their experimenters’ ambition.

Animal experimentation in *The Virtuoso*, however, carries more obviously political implications than in the “Ballad”, because it speaks to the scientist’s desire to destabilize fixed social categories. Gimcrack’s endeavour to transform the natural properties of creatures and objects belies his stated aversion to usefulness (2.2. 85; 5.3. 79). Rather, his interest in particular anatomical practices, like blood transfusion, relates to a broader project to transform the nature of living things, their physical form, but also their social reality. Science is merely a manifestation of his abiding enthusiasm for transmutation; even at the end when he forswears experimentation, he does so only in order to “study for use,” by which he means “find out the philosopher’s stone” (5.6. 130-131). As Gilde suggests, this turn towards alchemy evinces a more generous attitude toward the Royal Society than is generally conceded. The Royal Society had always disavowed alchemy, and thus Shadwell uses “the Society’s position as a standard of good sense by means of which Sir Nicholas’s final folly may be judged.”\(^{78}\) However, few of

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\(^{77}\) Printed in Dorothy Stimson, “Ballad of Gresham Colledge,” *Isis* 18.1 (1932): 103-117, 108-117, 110: 44-48. According to Stimson, the author’s familiarity with visit and other details suggests he was probably a member of the Society. The article makes a solid circumstantial case that it was Joseph Glanvill who wrote the “Ballad”.

\(^{78}\) Gilde, 479.
Shadwell’s contemporaries seem to have drawn this connection, possibly because Gimcrack’s scientific experiments are already so deeply inflected with an alchemical desire to transmute.

This desire most clearly manifests itself in Gimcrack’s experiments on blood transfusion, which he approaches as a kind of naturalistic philosopher’s stone, transmuting the essential character of animals and people. He recounts a preposterous experiment in which he had transfused the blood of a sheep into a madman, producing a bizarre hybrid:

The patient from being maniacal or raging mad became wholly ovine or sheepish: he bleated perpetually and chew’d the cud; he had wool growing on him in great quantities; and a Northamptonshire sheep’s tail did soon emerge or arise from his anus or human fundament” (2.2. 190-194).

Shadwell invites us to laugh at this obviously fraudulent account, but the social implications of such experiments would not have been missed. While he transforms his madman into an innocuous curiosity, a similar experiment, the above mentioned transfusion between a bulldog and a spaniel, gestures towards a more troubling scientific project of destabilizing social hierarchies. As with the sheep-man, the dogs’ physical characteristics are rendered fluid, with “the spaniel [becoming] a bulldog and the bulldog a spaniel” (2.2. 127-128). Yet it is not simply the bodies that change, but the essential makeup of their social character. Shadwell’s choice of breeds is not incidental. The spaniel was closely associated with royalty, and beginning with Hans Eworth’s sixteenth-century portrait of Queen Mary and King Philip, it served as a regular visual emblem of the English monarchy. The spaniel was, moreover, a favourite dog of Charles II, who eventually lent his name to the King Charles breed. Thus, few would have missed the significance of Gimcrack transposing the “civil ingenious temper and education of the spaniel with the rough untaught savageness and ill-breeding of the bulldog” (2.2. 129-131). The obvious implication of these experiments is that scientists like Gimcrack intend to dissolve the innate social qualities upon which England’s political structures rest.

But Gimcrack is not merely content to facilitate this kind of social alchemy. The ultimate purpose of his study, he implies, is to expand his own dominion. Regarding his swimming experiment, for instance, he declares, “I doubt not, sir, in a very little time to become
amphibious” (2.2. 27-28). This fanciful claim invokes a rapidly emerging satirical tradition of virtuosi employing their machines to magnify their own status. An early example of this is found in Samuel Butler’s poem “Elephant in the Moon” (c1670), in which an astronomer of “curious microscopic Wit” imagines that his telescope will magnify himself “In home and foreign Colleges.” The astronomer convinces himself, and his scientific society, that his optic glasses have revealed a civilization in the moon, and upon learning this, they immediately begin to speculate on the imperial dominions they will soon establish there. Butler’s poem dovetails with a much older satiric tradition, dating back to antiquity, in which travellers offer political accounts of lunar, and other fantastic, societies. In Shadwell’s time, however, the moon and other celestial kingdoms had become associated with the wild aspirations of natural philosophers. Thus Gimcrack proclaims that it will soon “be as common to buy a pair of wings to fly to the world in the moon as to buy a pair of wax boots to ride into Sussex with” (2.2. 34-36). But where earlier lunar utopias were devices for critically examining earthly governments, Restoration satirists more frequently associated them with socially ambitious scientists.

Disloyalty to the monarch is an ongoing theme in scientific satires. Nowhere is the destabilizing character of natural philosophy more apparent than in Aphra Behn’s Emperor of the Moon (1687). Behn’s farce centres around a cuckold plot in which the Gimcrackean Dr. Baliardo is fooled into believing a celestial monarch will soon descend from the sky to claim dominion over earth. Baliardo enthusiastically renounces England, and indeed the rest of humanity, and pledges servitude in exchange for political favour. Gimcrack never explicitly disavows his monarch, but as Shadwell repeatedly hints, patriotism is not to be counted among the virtuoso’s virtues. Expounding upon Sir Formal’s assertion that a lunar intelligence “would be of infinite advantage to us in the improvement of our politics” (2.2. 41-42), Gimcrack reasons that since the moon is


80 Examples include Lucian’s True History (c. 200 CE) and Cyrano de Bergerac’s Histoire comique contenant les états et empires de la lune (1657). Margaret Cavendish cites both of these sources as inspiration for her own anti-scientific travelogue, The Blazing World (1666).

“governess of moist bodies,” it would produce “no doubt, the superior government of all islands” (2.2. 44-45). He similarly believes his ant colony to be “the best government in the world,” likening it to “a republic resembling that of the States General” (3.3. 29-30, 32-33). He thus comes dangerously close to affirming the Dutch Republic, which was foremost among England’s economic and military rivals. Worse yet, Shadwell aligns Gimcrack’s science with the recently deposed Parliamentarian regime. Alluding to Robert Boyle’s work on luminescence, Sir Nicholas boasts that he once “read a Geneva Bible by a leg of pork” (111). The Geneva Bible was the bible of Cromwell and the Puritains, who renounced the Anglican bible of King James, a detail to which audiences would have been highly sensitive so soon after a generation of civil war and interregnum government.

These hints of disloyalty might not amount to treason. The Gimcrack type is not politically interested enough to rebel, but his work threatens the social order nonetheless. Shadwell’s point is rather that Gimcrack’s obsession with technological innovation blinds him to the social implications of his projects. At one point he even proposes an invention that would enable the king to reign as a tyrant. The invention in question is a stentrophonical tube—or “speaking trumpet” as Bruce more plainly calls it—through which “a man may be heard round the country” (5.2. 55-56). With the aid of this machine, he declares, England would require only a single parson to preach to the nation, which would allow the king to “take all the church lands into his own hands and serve all England with his chaplains in ordinary” (5.2. 60-62). When the more level-headed Longvil inquires after the fate of the displaced preachers, Gimcrack replies that they could turn their energies towards industry, and “learn to make woollen cloth and advance the manufacture of the nation, or learn to make nets and improve the fishing trade” (5.2. 65-67). From a purely commercial perspective, this is a reasonable solution; however, Gimcrack characteristically fails to consider the social consequences of dispossessing such a large segment of the population, whom he means in turn to restructure the base of England’s labour economy. The play revisits this theme in the culmination of Gimcrack’s plotline, wherein a group of weavers abruptly lay siege to his house in response to a rumour that he has invented an engine that will put them out of work. The social order is quickly restored, however, when Gimcrack is forced to admit that he has “never invented so much as an engine to pare cream cheese
with” (5.3. 78-79). Herein is the political crux of *The Virtuoso*, and a theme that satirists would revisit throughout the eighteenth century. It is not the products of science that are unsettling, but the potential ramifications of their successes, which is why symbolic closure nearly always comes by reassuring the audience of science’s impotence.

4. Science and Social Innovation

The burlesque scientist is a fundamentally anti-social figure, characterized by his aversion to normal human relationships. But why should this be the case? What special traits did satirists and their audiences see in science that engendered such associations, and allowed them to retain their currency for so long? The peculiar anti-sociality of the Gimcrack type is not shared by earlier philosophical or scholastic types. As Shapin points out, the “pervasive topos in Western culture, from the Greeks onward, stipulates that the most authentic intellectual agents are the most solitary.”82 Yet this type of asociality does not characterize burlesque natural philosophers. They are not sages who live alone on the social periphery, and interact with their communities only for the purpose of imparting wisdom. Rather, they are self-assertive and parasitic. Gimcrack and his ilk ravage hereditary estates producing no intellectual benefit for mankind, but great profits for instrument makers and money-lenders. Neither do burlesque natural philosophers fit into established literary traditions of philosophical charlatans. Though an ardent admirer of Ben Jonson, Shadwell tellingly opts not to base his virtuoso on the titular mountebank of *The Alchemist* (1610). Gimcrack may foreshew utility, and, as his uncle Snarl hints, lie about the results of his experiments (2.2. 194-195); however, he is a true believer in scientific progress. It is his unreflexive devotion to an ethos of innovation that makes him dangerous, and it is this same ethos of innovation that makes science antithetical to a stable society, wherein normal human relationships were based upon inheritance and tradition.

The new scientist is a figure of the ambitious middling orders. He represents what Nicholas Hudson describes as “slow revolution” towards a class-based understanding of society, from which emerged “a new kind of gentleman qualified for this status not by birth but by social

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success, wealth, and education.” And it is this middle-class inflection that sets the Gimcrack type apart from his literary antecedents. Royal Society apologists like Sprat may have insisted upon experimental science as a “noble Enterprise,” but they were never able to legitimize it as a properly genteel practice. As Shapin asserts, the early Royal Society lacked the cultural authority to establish the gentleman scientist within the nation’s “social repertoires.” Thus the gentleman scientist would not become a cultural fixture until the late nineteenth century, by which time science had developed “new sources of support and approval outwith genteel society.” In other words, the scientist could only become properly respectable when middle-class institutions outgrew hereditary estates, both in terms of wealth and social influence. The development of modern science was always intertwined with the emergence of England’s middle classes, which is why the most pervasive characteristics of the Gimcrack type so closely align him with the social disruption brought about by the social pretentions of the ascending middling sort.

The Gimcrack figure is individualistic and self-interested. He places his own interests before those of king and country, and turns his studies away from “mankind” towards “spiders and insects” and other trivial matters (5.5, 123). His obsession with trinkets and curious objects leads him to neglect his estate to the point of ruin, and his hereditary wealth often falls into the hands of capitalists who have no interest in social continuity. Finally, he is oblivious to the social relations that frame his society; he neither understands the political underpinnings of marriage, nor the aristocratic economy of mutual-obligation. In short, the burlesque scientist manifests the most troubling features of the socially dynamic middle orders.

The question remains, however, as to why the scientist became a consistent figure of political-economic upheaval. And an answer to this is found in an emerging, though guarded, appreciation


84 Sprat, 9.


for corollary ideas of progress and innovation. As standard tropes from Shadwell’s time attest, science was regarded as a kind of rebellion against ancient customs and structures. This is not to say there were no aristocratic natural philosophers. About a third of the original Royal Society was composed of gentlemen.\(^{87}\) However, the innovative character of the new sciences was seen by many as fundamentally incommensurable with fixed hereditary categories. This perceived incompatibility explains in part why the gentleman scientist never fully entrenched itself in England’s social repertoires. David Spadafora’s influential book on The Idea of Progress in Eighteenth-Century Britain traces the ideological ascent of what he defines as, “the belief in the movement over time of some aspect or aspects of human existence, within a social setting, toward a better condition.”\(^{88}\) Spadafora’s comprehensive study proposes that Britain’s rapid commercial, and later industrial, growth, was propelled by the same impetus towards improvement that propelled its rapid scientific growth. Spadafora traces this culture of innovation to Francis Bacon’s Advancement of Learning (1605) and Novum Organum (1620). It has since become commonplace for scholars to credit Bacon’s naturalistic program with sparking Britain’s economic, as well as scientific, revolution. Joel Mokyr asserts, for instance, that for Bacon and his intellectual heirs, “‘useful knowledge’ (roughly speaking, science and technology) could become an engine of economic progress.”\(^{89}\) Spadafora stops just short of exalting Bacon as a Great Man of Britain’s intellectual history, with the more moderate claim that “Bacon sounded themes” which would reverberate throughout the seventeenth and eighteenth centuries.\(^{90}\)

Britain’s growing enthusiasm for progress did not truly originate with Bacon, but he was one of the most persuasive voices to articulate a sentiment that was taking hold in England and on the Continent. Prior to Spadafora’s book, the standard scholarly position, proposed by J. B. Bury,

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\(^{87}\) Hunter, Science and Society, 36-37.


\(^{90}\) Spadafora, 6.
was that the notion of progress had been a French import. Spadafora may go too far in isolating Britain’s intellectual history from that of Europe. However, he is no doubt correct that, from the late seventeenth century forward, Bacon came to represent a distinctly English spirit of innovation. His call to reject inherited knowledge resonated with the early Royal Society. It earned him the status of their intellectual progenitor, and wider fame as the father of empiricism, despite the fact that his own writing was remarkably un-empirical. In many ways, Bacon is a curious figurehead for the Society to have chosen, since his studies were inconsistent and unsystematic. If there ever were a Baconian Method, Bacon himself did not practice it. As one scholar writes, “there is hardly one subject which he mentions more than once […] on which he did not flatly contradict himself.” Yet Bacon did contribute to empirical methodology by challenging the “weake conceite of sobriety or an ill-applied moderation” in learning, and endeavour instead towards “endless progress” of knowledge. Underwriting this ethos of change was the idea that “the progress of science [could] bring progress in general.”

The Society honoured Bacon as a champion of innovation, which was mainly a pejorative concept in his own lifetime, connoting political instability and even revolution. In Shakespeare’s *Henry IV Part I*, for instance, Prince Hal scorns Worcester’s rebels as “fickle changelings, and poor discontents [who gape] at the news of hurly burly innovation.” These revolutionary connotations lingered throughout the seventeenth century, as demonstrated in a 1641 account of Archbishop William Laud’s supposed acts of treason, which charges him with, among other things, “bringing innovations into the Church.” During the Restoration period, however, attitudes towards innovation had softened enough that Royal Society experimenters and

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94 Agassi, 15.


propagandists were using it to align themselves with a Baconian conception of progress, and the superiority of modern learning. Boyle’s essay on *The Usefulness of Philosophy* (1664), for instance, calls for “Innovation” in chemical medicine.\(^97\) Similarly, after examining “the influence of *new Experiments,*” and all the “Innovation of which they can be suspected,” Sprat concludes that nothing will be endangered “but only the *Physics of Antiquity,*” wherein “many things of greater concernment will arise.”\(^98\) Within the space of only a few decades, innovation had undergone such a conceptual reformation that the Society could accuse their critics of intellectual backwardness if they failed to embrace innovation. This is the case in a 1724 essay on the controversy over smallpox inoculation, which asserts that “Anti-Inoculators are besieged” by a preponderance of evidence in support of the practice, but superstitiously declare it an “Anti-Christian” practice, and maintain “that such an Innovation is not to be countenanced.”\(^99\)

However, not everyone in Restoration England embraced the spirit of innovation, or even its reformed usage. John Dryden invokes the concept with its earlier rebellious connotations in his 1681 heroic-satire of the Monmouth Rebellion, *Absalom and Achitophel,* declaring that “All other errors but disturb a state,/ But innovation is the blow of fate.”\(^100\) He does not quite condemn the concept, but he warns against glorifying it as an end unto itself. Thus he continues that:

> If ancient fabrics nod, and threat to fall,

> To patch the flaws and buttress up the wall

> Thus far 'tis duty; but here fix the mark,

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For all beyond it is to touch our ark.\textsuperscript{101}

This allusion to the irreverent Uzzah—struck dead for touching the Ark of the Covenant (2 Samuel 6: 1-7)—does not refer to the Royal Society directly.\textsuperscript{102} Dryden was, after all, briefly enthusiastic about science, and as a member of the Society from 1662 until around 1665, at which time he was quietly expelled for truancy and non-payment of dues.\textsuperscript{103} Moreover, \textit{Mac Flecknoe} repeatedly cites \textit{The Virtuoso} as a product of Shadwell’s “ignorance” and “fruitless industry” (146, 147). Though, perhaps tellingly, the poem does not censure the play’s satire of science, but instead aligns Shadwell with the vapid orator Sir Formal Trifle, and the coxcomb Sir Samuel Hearty (168, 181). Dryden was of two minds about England’s growing culture of innovation, as were many in the seventeenth and eighteenth centuries. As late as 1783, Samuel Johnson, who was generally optimistic about the progress of the useful arts, wryly asserts that “the age is running mad after innovation […] even] men are to be hanged in a new way; Tyburn itself is not free from the fury of innovation.”\textsuperscript{104}

It is no coincidence that the rise of modern science and the rise of the middle class occurred along the same trajectory, since both grew from the same ideological turn towards progress and innovation. Scholars like Hudson have rightly cautioned against deploying “a modern notion of ‘middle class,’ or indeed ‘class’ in a modern sense” onto the eighteenth century.\textsuperscript{105} There is, however, a notable shift in the vocabulary of the seventeenth century, regarding how to imagine the social makeup of the nation. Language of “‘estates’ [and] ‘orders’,,” which described society in terms of traditional social function, began to give way to the language of “classes,” which

\textsuperscript{101} Dryden, “Absolom,” 519: 801-804.

\textsuperscript{102} \textit{The Holy Bible, Containing the Old and New Testaments, King James Version} (New York: American Bible Society, 1999).

\textsuperscript{103} For Dryden’s questionable participation in the Society, see Claude Lloyd, “John Dryden and the Royal Society,” \textit{PMLA} 45.4 (1930): 967-976.


distinguished and evaluated people by (theoretically) fluid economic criteria. According to Penelope Corfield, we can observe the unfixing of social structures through the era’s “expanding vocabulary, experimentation in usage, and fluidity of style and expression.” And as Peter Earle notes, one of the most significant linguistic trends among the middling sort is an emphasis on social dynamism, expressed in discourses of “accumulation, self-improvement and the employment of labour and capital.” Like “science”, “class” remained an unsettled term until at least the early nineteenth century, and, as Hudson notes, certainly did not reflect an ideology of “upward mobility” typical of our time. But while class mobility may not have come to fruition in practice, the superabundance of terminology reflects an emerging enthusiasm for transformation and progress.

*The Virtuoso* is utterly preoccupied with the consequences of middle-class dynamism, in particular the shift in social power away from land-based wealth towards capitalist wealth, a matter of great urgency throughout the eighteenth century. As Clarinda notes, Gimcrack “bears all hope” of his family’s estate (1.2. 40-41); yet, his obsession with novelty, and gaining status among the new scientists, has cost him thousands of pounds in “microscopes to find out the nature of eels in vinegar, mites in cheese, and the blue plums which he has subtly found out to be living creatures” (1.2. 7-10). At the beginning of the play, he is on the verge of bankruptcy, and by the end, his “land in the country is extended” and his “goods are seiz’d” (5.6. 85-86). At the play’s conclusion, marriage is the only thing that prevents Gimcrack from squandering his niece’s inheritance, as they are able, at the last moment, to “put [their] estates” into the hands of Bruce and Longvil (5.6. 134). Thus in the end, Gimcrack’s wastefulness is thwarted by a conventional aristocratic property exchange. However, fleeting symbolic victories such as this

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109 Hudson, 567.

110 See Corfield, especially 106-109.
did not alleviate anxieties for long, and would continue to play themselves out in burlesques and satires for the next century and more.

5. Chapter Summary

This dissertation is organized around five case studies, arranged chronologically from the Restoration to the end of the eighteenth century. Each case focuses upon satirical, or parodic, treatments of science at different moments of intersection between science and class. The obvious risk of a longitudinal study such as this is the natural tendency to imply a triumphalist, “rise of,” narrative, both in terms of science and the middle class. A snapshot method, however, allows me to explore literary treatments of science at different points in its visibility without asserting a teleological narrative. I approach each case as a transitional moment in a process of perpetual transition, and do not attempt to excavate for “missing links”. I map changing perceptions of science and class, and draw attention to enduring themes and tropes, but do not concern myself with pinpointing precise moments of cultural transition.

The first case study is of the Duchess of Newcastle, Margaret Cavendish (c1623-1673). A sentinel for hereditary authority, Cavendish penned a number of belligerent critiques of the Royal Society. The most prominent of these included a philosophical treatise, Observations upon Experimental Philosophy, and a fantastical travelogue, The Description of a New World Called the Blazing World, published together in 1668. Blazing World satirizes the experimental philosophers of the Royal Society, depicting them as quibbling beasts, including near-sighted worm men, and cantankerous bear-men; at the same time, Observations systematically refutes the Society’s experimental method. While these books indict all forms of natural philosophy, they focus their animosity on Hooke. For Cavendish, Hooke and his machines represented a revolt against traditional forms of authority. She explicitly likens mechanical philosophers to the parliamentarian revolutionaries of the Civil War. Cavendish articulates the perceived link between epistemic and political upheaval, which would continue to motivate scientific satires long after her death.
The next study is of the real life burlesque natural philosopher, Dr. John Woodward, a dedicated, and nearly brilliant, naturalist. When Woodward is remembered today, it is not for his greatest achievement of bringing fossil theory to western science. Rather, it is as the person most frequently satirized by the so-called Scriblerians (notably, John Arbuthnot, John Gay, Alexander Pope, and Jonathan Swift), who pilloried him individually and in collective works like the *Memoires of Martinus Scriblerus* (pub. 1741), and *Three Hours after Marriage* (1717). While Woodward made some notable discoveries, his science alone cannot account for his infamy. He was a visionary in many respects, but no less prone to wanton speculation than his contemporaries. As with Hooke, Woodward’s career as a scientist permitted him to transcend his common origins, and his perceived uppishness was a central point of attack from the likes of Pope and Swift. Through a relentless campaign of satire, Woodward’s detractors constructed him as an incarnated Nicholas Gimcrack. Framed as an impudent and ambitious figure, Woodward became metonymical of the perceived lowness of experimental philosophy. He was a favourite satirical butt in part because he seemed to confirm the incongruity between science and genteel society.

Chapters three and four explore a transitional period in the reception of science, which had, by mid-century, unquestionably legitimized itself as an authoritative mode. As the eighteenth century wore on, science became a considerable source of interest for the increasingly literate middle classes. The booming periodical market introduced reading publics to the latest scientific advances, and popular science was becoming a significant literary genre. At this point, we would expect a shift in depictions of literary scientists—perhaps the emergence of new scientific types, as occurred in the nineteenth century—but no such shift occurred. Authors like Henry Fielding and Samuel Johnson played with satirical conventions, of virtuosi that squander their fortunes on “Butterflies and Cockle-Shells” and endanger their lives with reckless experiments, but Fielding and Johnson’s appreciation for science was always veiled beneath these familiar tropes, which, in turn, encoded conflicts about the ascendancy of the commercial classes.\footnote{Henry Fielding, “Towards a Natural History of the Hanover Rat,” *Champion*, 656-668, 667; Samuel Johnson, *The Rambler: The Works of Samuel Johnson*, vol 5, ed. W. J. Bate and Albrecht B. Strauss (New Haven: Yale University Press, 1969), 272.}
There is probably no mid-century author more strongly associated with a moral and aesthetic aversion to science than Fielding. The third chapter challenges these scholarly preconceptions, which are based mainly in the tenacious mid-twentieth-century myth of his “Augustan” sensibilities. While Fielding utilized familiar conventions, particularly in his early career as a playwright, his treatment of science evinces a fuller appreciation for science than has thus far been acknowledged. This chapter pays particular attention to Fielding’s three longest scientific parodies, all published during his periodical phase between 1737 and 1743, and it argues that such works were products of his scientific interest. He could not have written these parodies without current knowledge of scientific developments as well as the conventions of scientific writing, nor would his audience have been able to appreciate the parodies if they did not share his familiarity. Beyond demonstrating the close relationship between science and periodical culture, this chapter refutes still-prevalent notions that science was considered antithetical to mid-century theories of knowledge and aesthetics.

The next chapter examines scientists in oriental tales. At the same time that science was permeating the non-fiction world of periodicals, it was finding a home in imaginative literature. The scientist figure is a regular feature of eighteenth-century oriental tales. For the past several decades, post-colonial scholarship has preoccupied itself with the ways in which orientalism served Europe’s imperial project by rendering the east primitive and alien. However, more recent scholarship has acknowledged the oriental genre as the imaginative counterpart to the domestic novel. Like science fiction today, the eighteenth-century orient provided freedom for authors to explore implications of emerging cultural productions. The imaginary orient regularly staged thought experiments regarding the practical implications of emergent technologies. This chapter focuses on Samuel Johnson’s philosophical History of Rasselas Prince of Abissinia (1759) and William Beckford’s Vathek (1786). Rasselas and Vathek utilize the otherworldly space of the literary orient to imagine the implications of soon-to-be realized feats of engineering, such as manned flight and large-scale canal projects.

The final chapter examines Elizabeth Hamilton’s putatively “anti-Jacobin” satire, Memoirs of Modern Philosophers (1800). Over a century after Cavendish’s seemingly paranoid declarations that science threatened monarchy, science had become a major factor in revolutionary discourses.
French Jacobins deployed naturalistic conceptions of energy and autonomous matter to serve their revolutionary propaganda. And although revolutionary sentiment dissipated quickly in England after 1791, popular culture continued to associate experimental science with political revolt. Thus, political reforms proposed by the likes of William Godwin and Joseph Priestley became entangled in anti-Jacobin hysteria, which was itself entangled in late century scientific discourses. Hamilton’s satire captures the disjunction of social conservatives who at once embraced the progressive ethos shared by science and middle-class economics, but who continued to see progress as a threat to traditional hierarchies. While Hamilton articulates a pro-science attitude, her many indirect attacks on all branches of experimental philosophy, particularly as it was mobilized by political revolutionaries, points to the same unspoken tension found in traditional, Gimcrackean, satires.
Figure 1. Thomas Rowlandson, *Looking at the Comet till You Get a Crie in the Neck* 1811, Lewis Walpole Library, Farmington CT
Chapter 1
Philosophy of the Wrong Sort: Margaret Cavendish’s Royalist Opposition to Experimental Science

Since early scientific satires were directed more towards cultural innovation than towards empirical study, it should come as no surprise that many eminent critics of science were themselves enthusiasts and even practitioners. In the early days of the Royal Society, experimental science was a fashionable pastime among those in the Restoration court, while at once a popular subject for mockery by many of the same people, including the Society’s most famous benefactor, Charles II. No author better embodies this contradictory reception than the poet-philosopher and Duchess of Newcastle, Margaret Cavendish (c1623-1673). A prolific writer, Cavendish was drawn to contemporary debates regarding the origin and organization of matter. Her first publication on the topic was *Philosophical Letters* (1664), which audaciously critiques major thinkers like René Descartes, J.B. Van Helmont, Thomas Hobbes, and Henry More.¹ And, while experimental philosophy features among the book’s targets, a more aggressive attack followed soon after in her philosophical treaties, *Observations upon Experimental Philosophy*, and her fanciful romance, *A Description of a New World, Called the Blazing World*, which were published as a single volume in 1666.² The first of these—written after satirical travelogues like Lucian’s *True Stories* (c125-200 AD) and Cyrano de Bergerac’s *Histoire comique content les états et empires de la lune* (1657)—depicts mechanical and natural philosophers as capricious beast men who are addicted to novel studies, and who “take more delight in artificial delusions, than in natural truths” (28). *Observations* is more pointed and systematic in its criticism of the Royal Society’s “deluding experiments,” and especially the “deluding glasses” touted in Robert Hooke’s sensational 1665 publication, *Micrographia: Or


Some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses (196, 4). These challenges to the Royal Society have enjoyed significant scholarly attention in recent decades, and are generally attributed either to Cavendish’s idiosyncratic conception of nature or, more frequently, to her personal animosity towards the scientific patriarchy. This chapter diverges from such conventions by placing her at the forefront of a tradition of satires that correlated scientific innovation with the disruption of traditional political hierarchies, an attitude which would continue to motivate satires of this sort throughout the eighteenth century.

It is difficult to gauge the impact of Cavendish’s attacks on the status of the Royal Society, since, as James Fitzmaurice writes, historians and biographers “for the most part, discuss the writer but pay scant attention to the work.” However, Blazing World and Observations were likely regarded as curious publications from an author of high social status but low literary and philosophical merit, and the books probably had little effect on the Society’s already tenuous reputation. Cavendish was a minor celebrity in her lifetime but was not much discussed immediately after her death. In the mid eighteenth century she was picked up as “a harmless, even delightful eccentric”; in the nineteenth century she was admired as “a loyal wife who suffered with her husband in exile”; and in the early twentieth century she was rediscovered as a kind of literary visionary, who had unfortunately been cast aside as “Mad Madge of Newcastle.” Only in the late twentieth century did academics begin paying serious attention to her philosophical writing. Most of this work has been done by feminist scholarship, which has praised her natural philosophy as a deliberate counter-model to the masculinist view of nature set forth in Francis Bacon’s Novum Organum Scientiarum (1620). A few scholars, like Emma Wilkins and Deborah Boyle, have challenged this narrative, asserting gender was less central to

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5 Fitzmaurice, “Cavendish.” Fitzmaurice suggests the label “Mad Madge” was likely a nineteenth-century innovation, possibly inspired by Mad Madge Murdochson of Walter Scott’s Heart of Midlothian (1818).
her relationship with the Society than has been supposed. However, such arguments have been only minimally impactful, and issues of gender continue to frame most discussions of Cavendish and science. Denise Tillery narrowly avoids essentialism in asserting that Cavendish’s “sympathetic writing style went hand in hand with her organic and situational practice of natural philosophy.” Lisa T. Sarasohn’s authoritative book on *The Natural Philosophy of Margaret Cavendish* similarly foregrounds gender, while more moderately asserting that “Cavendish was aware of her sex, personally and collectively, and this recognition produced the gendered elements of her natural philosophy.” But while Cavendish was a singular figure whose gender limited her from full participation in scientific communities, this chapter is concerned less with what set her apart from her philosophical contemporaries than what she held in common with other satirists of science, in her own time and across the next century.

Despite her many peculiarities, Cavendish was quite typical in framing scientists as ambitious social climbers, and in her strategy of couching political objections to science within the rhetoric of utility. A key motif in *Blazing World* is the notion of mechanical philosophy as “unprofitable and useless work” (43), and she revisits this notion even more frequently in *Observations*, declaring, for instance, that mechanical philosophy is “the emulative ape of nature, [which] makes often vain and useless things” (59). This was a standard point of attack in Cavendish’s day and would remain so across the eighteenth century, despite the Royal Society’s concerted efforts to avoid “strenuous claim[s] to the direct and immediate utility of natural philosophy.”

Regardless, the Society was under constant fire for failing to realize ambitious (often straw-man) claims that advances in practical knowledge would soon lead to economic prosperity, military dominance, and political stability; and the Society quickly came to be perceived as embodying

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8 Lisa T. Sarasohn, *The Natural Philosophy of Margaret Cavendish: Reason and Fancy during the Scientific Revolution* (Baltimore: Johns Hopkins, 2010), 175.

the chimerical promises of a few ambitious projectors. As this chapter argues, however, Cavendish invoked utility as a convenient pretence, but her real concern was the relationship between science and society. Accusations of science’s inefficacy often belied apprehensions that experimental science was a kind of epistemic coup staged by artisans, mechanics, and other people of the lower sorts. As a natural philosopher, affirmed royalist, and outspoken critic of the Royal Society, Margaret Cavendish serves as an ideal case study through which to explore the ambivalent and complex reception of science during the Restoration period. While she was not alone in recognizing science’s potential to disrupt epistemic hierarchies—and, by implication, political hierarchies—she articulated the link between revolutions in knowledge and political revolution more plainly than any of her contemporaries.

1. Cavendish and the Politics of Science

Cavendish presented herself as a scientific outsider, but she was not quite the stranger to experimentation that she claimed. Until recently scholarship has taken it at her word that she scorned both “the methods and utilitarian aims of science.” And this conventional understanding continues to influence those like Susan James, who accepts Cavendish’s criticisms of the Royal Society as proof that she “dismissed [the] experimental approach,” and Elizabeth A. Spiller who more boldly asserts that Cavendish “reject[ed] the notion of verification itself.” Yet the content of her philosophy was always subordinate to her literary and philosophical persona. As Fitzmaurice notes, Cavendish was deeply invested in fashioning herself as “a solitary genius” who harnessed “the power of ‘fancy’ in her brain to create ‘fancies,’ that is, original compositions in verse and prose.” It is nearly certain that she understood far more about science than has been supposed. She studied natural philosophy from a young age, tutored by her


older brother Charles, and later by her husband and her brother-in-law. She refined her education while in exile during the Interregnum, where she occupied a central position at her husband’s philosophical salon, which brought her into contact with mechanists such as Descartes and Gassendi. Hobbes and More reviewed early drafts of her natural philosophy, though they appear to have taken only a shallow interest in it. And she continued to engage with prominent members of the scientific community after returning to England, corresponding with the likes of Joseph Glanvill, and Constantijn Huygens. Virginia Woolf famously bemoaned Cavendish’s un-nourished genius, lamenting that “she should have had a microscope put in her hand. She should have been taught to look at the stars and reason scientifically.” But, in fact, Cavendish was well-acquainted with the tools of science, and apparently “used the family laboratory quite often.” The evidence thus suggests that her sweeping rejection of experiment, and of the tools of science, was a something of a strategic exaggeration on her part.

Cavendish’s scepticism of experimental science is best understood through its relation to her political philosophy. Nowhere is this connection more apparent than in her early atomist theory, which she subsequently rejected for its revolutionary implications. Her first philosophical publication, *Poems and Fancies*, was a collection of verses through which she proposed a theory of autonomous matter. Her poems depict a world in which capricious atoms “dance about” until “fit places [they] find,/ [And] Such *Formes* as best agree, make every kinde.” However,


16 Akkerman and Corporaal, 5.


she soon renounced this vision on the basis that ungoverned matter would inevitably result in “an infinite and eternal disorder.” In its place, she proposed a theory in which vital matter retains a degree of autonomy but is ultimately subject to nature’s monarchical dictates.

Scholars have readily acknowledged the political hierarchies embedded in Cavendish’s philosophy, though they tend to relegate politics to a matter of secondary importance. As Anna Battigelli points out in her formidable book *Margaret Cavendish and the Exiles of the Mind* Cavendish, like other writers of her time, regarded new scientific systems as metaphors for the political world. Yet, as the book’s title suggests, Battigelli emphasizes Cavendish’s status as an outsider, first as a political exile, and later as a (partially self-imposed) exile from the philosophical mainstream and the centers of science. Accordingly, she latched onto ideas regarding “inwardness, interiority, and selfhood,” which “were reaching full development in Hobbes’s and Descartes philosophies of mind.” Thus, Battigelli implies, Cavendish’s eventual rejection of empirical science was at base an epistemological rejection of “Hooke-like claims of objectivity and certainty regarding the external world.” While Battigelli deals extensively with the political motivation behind Cavendish’s rejection of atomism, she says little about the revolutionary analogies that pervade Cavendish’s later work. Her vitalist philosophy regularly figures experimental science as a form of social revolt, and it is doubtful whether this is entirely metaphorical. In *Philosophical Letters* (1664), for instance, she accuses mechanical philosophers of appropriating “the conceptions of studious men,” and “ungratefully attribute[ing] all to their own industry.” Far worse than an act of intellectual theft, Cavendish regards this as a collapse of the civil order. As she writes, the experimenter is of the same order as a servant, and thus


21 Battigelli, 10.

22 Battigelli, 105.

“ought to acknowledge [the studious philosopher] as his Master.” Instead, the presumptuous scientists of the Royal Society trespass against the innate authority of their social betters.

2. Philosophy from the Centre: Cavendish’s Royalist Identification

The first serious discussions of Cavendish’s natural philosophy emerged largely as a by-product of feminist analyses of Bacon’s rhetorical legacy. Politically progressive scholarship of this sort was inclined to approach Cavendish as a likeminded progressive, and this continues to steer conversations regarding her antipathy towards experimentalism. Evelyn Fox Keller’s ground breaking book *Reflections on Gender and Science* was among the first to interrogate the Baconian metaphor of Nature as coquettish woman whose secrets must be enticed out by the domineering male intellect. Soon after, Sandra Harding facetiously refigured the Society’s metaphorical “Book of Nature” as “Newton’s Rape Manual”. And it was during this scholarly moment that Lisa T. Sarasohn published her influential article, “A Science Turned Upside Down,” which asserts that Cavendish flipped the Baconian model of science as masculine domination, and proffered the counter-model of “a living universe, infused with motion, and ordered by a female spirit, which could best be understood from the empathetic viewpoint of a female scientist.” Sarasohn rightly observes that Cavendish reframes Bacon’s coquette into a “remarkably pragmatic and industrious” woman. As Sarasohn notes, *Observations* stresses the wisdom and good governance of Nature, while disarming potential critics by stressing her domestic virtues. For Cavendish, Nature is “a wise provident lady [who] governs her parts very wisely, methodically, and orderly […] like a good housewife” (105). Yet Sarasohn curates her


27 Sarasohn, 296.

28 Sarasohn, 296.
evidence in manner that suggests Cavendish’s philosophy was far more consistent and linear than it actually was. For instance, Sarasohn is unable to resolve a paradox in the same passage, which asserts the “female sex would be the fittest” for experimental philosophy, and only a few sentences later dismisses such “useless experiments” (105, 106). Moreover, in attempting to prove that “Cavendish’s feminism consisted of a flanking attack on traditional authority,” Sarasohn overlooks many striking passages throughout her work that appeal to conventional political structures and hierarchies of knowledge. In *Philosophical Letters*, for instance, Nature is not a housewife, but an absolute “Monarchess over all her Creatures.” And, like a European monarch, she is ultimately subordinate to God, who, Cavendish notes in *Observations*, can only be known through “the instruction of our blessed church” (217).

Subsequent scholarship more or less abandoned the empathetic model of Cavendish’s science, and acknowledged its hierarchical framework. However, there remains a clear desire to make her authoritarian bent palatable to contemporary liberal politics, as Catherine Gallagher attempts in framing Cavendish as a “Tory feminist” who was drawn to “the ideology of absolute monarchy,” because it “transitioned to an ideology of the absolute self.” Clearly, the image of Cavendish as an authoritarian royalist does not sit easily beside attractive images of her as a freethinking intellectual and social nonconformist. A number of scholars have thus suggested that “royalist” is too confining a term for such a divergent mind. Mihoko Suzuki writes that the “heteroglossia of diverse positions makes it difficult to assign a particular position to Cavendish.” Hilda Smith similarly claims that the conventional usage of “royalist” does not adequately characterize Cavendish’s politics. She did not, as has been supposed, merely echo the classic conservatism of

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29 Sarasohn, 302.


32 Mihoko Suzuki, *Subordinate Subjects: Gender, the Political Nation, and Literary Form in England, 1588-1688* (Burlington VT: Ashgate, 2003), 188.
her husband. Nor did the apparently benign matriarchy of her natural order align with the authoritarian monarchy she proposed in a 1660 letter to Prince Charles. Smith concedes that Cavendish occasionally parrots William’s opposition to broad political, religious, and intellectual liberty, but claims these are rare instances in which she temporarily adopts his persona.

Yet Cavendish’s monarchy is not always as benign as Smith would have it. In “A King’s Oration or Speech to his Subjects” (1662), Cavendish declares a tyrannical king preferable to the rebel who would overthrow him. And, in a “King’s Speech to His Rebellious Subjects,” she implies that a ruler who wishes to curb the “vanities, vices, and wickedness” of his subjects ought to govern through “severity instead of clemency.” Obviously, “royalist” is a blunt term, even when applied to an author who signed her publications as “The Thrice Noble, Illustrious, and Excellent Princess, the Duchess of Newcastle.” And Amelia A. Zurcher adds a welcome element of nuance to such discussions by refocusing seventeenth-century royalism as an ideological spectrum, ranging from “the dominant humanist model of the court and to the monarch who embodied it” and the courtier type, who was “more concerned with his own interests than with the monarch’s or God’s.” While Zurcher has little to say on Cavendish specifically, she seems to place her somewhere around the middle of this spectrum. In so doing, however, she downplays the overtly autocratic elements of Cavendish’s political writing, such as the above passages, and, as will be discussed, in the more sensational power fantasy of Blazing World.

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38 Zurcher, 152.
A critical point of agreement for nearly all Cavendish scholarship is that she wrote as a philosophical and social outsider. Yet the evidence suggests this is largely a product of her own myth-making. While she stressed the singularity of her natural philosophy, her basic theories were not radically out of line with those of her contemporaries. Neither was she quite the social outcast of her authorial persona, which she cultivated “as a privileged rhetorical stance.” Rather, she occupied a position of extreme privilege in England’s social hierarchy, looming over the highest ranking fellows of the Royal Society. And she knew it. Almost immediately upon marrying into the title of Marchioness, she began using her position to construct a cult of celebrity around herself, and labouring to enshrine her writing “in Fames high Tow’r.” In 1665, a year before she published *Blazing World* and *Observations*, her husband was made Duke of Newcastle-upon-Tyne, and she became Duchess. She wore the title without a hint of modesty, inflating it nearly to its bursting point in *Blazing World*, wherein a character proclaims her “a princess of the fourth or fifth degree,” and then explaining with studied precision that “a duke or a duchess is the highest title or honour that a subject can arrive to, as being the next to a king’s title; and as for the name of a prince or princess, it belongs to all that are adopted to the crown” (70). Cavendish takes several more sentences to justify her grandest claim that duchess is, in fact, “a title above a prince” (70). While the passage begins to feel pleading in its insistence upon her pre-eminence, it illustrates her near obsession with rank. As Peter Dear writes, the title of duchess “served as her trump card,” which she was always willing to play “to the advantage of her scholarly credentials.” He might have added that her title granted her a privileged vantage point from which to assail rival scholars.

Cavendish was not the only royal to profess an enthusiasm for science, while openly belittling its practitioners. Charles II likewise delighted in embarrassing the experimenters of Gresham College, even after granting their Society a royal charter in 1662. Royal Society founders might have reasonably expected a greater deal of support from the new king who fashioned himself as a classical virtuoso, who “had a laboratory in his palace at Whitehall where experiments were carried out by a royal chemist and his staff,” and who could boast an impressive cabinet of

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39 Battigelli, 7.

40 Margaret Cavendish, “A Dedication to Fortune,” *The World’s Olio* (1655), A1r.
curiosities. But he balanced this apparent affinity with an equal measure of contempt. It soon became common knowledge “that the interest that the King took in the Society was very shallow indeed.” In 1668, visiting Italian virtuoso Lorenzo Magalotti expressed chagrin at learning of the brashness with which Charles treated his scientists. As Magalotti writes, “I have learned that he is accustomed to call his academics by no other name than mes fous [my fools].” Samuel Pepys’s famous diary reports several instances in which Charles seemed to go out of his way to humiliate his Society’s experimenters as in February 1664, when he spent an hour or two at Whitehall, “laughing at Sir W Petty, who was there about his [proposed double-keeled] boat,” then travelled to Gresham where “he mightily laughed at [experimenters] for spending time only in weighing of ayre, and doing nothing else since they sat.”

Cavendish would emulate the king’s condescending posture, first in literature, with the Blazing World, before doing so in person at Gresham College. Her satirical travelogue follows a young Lady abducted from England who eventually becomes Empress of a fantastic realm of magic and science. Like Charles, the Empress initially appears to be a great patron of learning, encouraging her scholars to “study of several arts and sciences,” especially “in the invention of profitable and useful arts” (18). She even charters her own philosophical societies, whose research closely resembles the science of Gresham College. However, she imitates Charles even further when her patronage soon becomes patronizing. One of her first acts as monarch is to call upon her scientists to parade for her their various wonders, while she systematically dismisses them as trifling, or even, as will be discussed, politically dangerous. A year after this literary abasement, Cavendish paid a visit to Gresham to embarrass the Society in person.


43 Quoted in Middleton, 14, original brackets. Middleton acknowledges that Magalotti actually wrote “mes furets”, or “my ferrets”; however, Middleton takes this to be a spelling error resulting from Magalotti’s imperfect French.

The scant records report that she did not have much to say to her hosts. Pepys was present for the visit, but records little except that she toured their College “full of admiration, all admiration.”

Since Cavendish was the first woman honoured with an invitation to Gresham, scholars have assumed she was awed by the experience. As one writes, “She did not want to resemble Milton’s Eve […] and] therefore waited for Adam to explain the complicated scientific problems for her.” However, the circumstances of her visit suggest she was neither honoured nor awed. Rather, she appears to have coerced the invitation by leveraging her title and hinting at a donation to the Society’s building fund. She arrived late, making her hosts wait as a crowd amassed to glimpse the eccentric duchess. Finally, John Evelyn writes, she arrived “in great pomp.” Leading a large procession, she wore a costume more suitable for the stage than the laboratory. Among her entourage was a singing lady on loan from Charles’s court, an apparent gesture of complicity from a king who loved to taunt his fous. One onlooker recounts that she “was all the pageant […] discoursed on: Her breasts [were] all laid out to view in a play house with scarlet trimmed nipples.”

Evelyn describes her outlandish attire in verse, which reads in part, “Her head gear was so pretty/ I ne’ere saw anything so witty […] She look’d so like a cavalier/ But that she had no beard.” The gentlemen of the Royal Society did what they could to maintain their professional dignity. They attempted to impress her with spectacles of magnetism, chemical corrosion, and even a demonstration of Boyle’s iconic air-pump, none of which elicited much comment.

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45 Pepys, 8: 243.


49 For a fuller account of the visit Sarasohn, Natural Philosophy, 32-34.

50 Dudly North to his father, 1667, Bodleian Library MS North c. 4146r. Quoted in Sarasohn, Natural Philosophy, 30.

51 Evelyn, 3: 482-483.
The details of Cavendish’s visit suggest a drastic change in demeanour from her earliest years as a philosopher of precarious political and economic status. The painfully self-conscious prefatory matter of her *Philosophical and Physical Opinions*—which contains two addresses to the reader, two epistles to the reader, and a general preface—pleads for posthumous recognition, since “Being a Woman” she could not “Preach, Teach, Declare, or Explain […] her philosophical opinions to the scientific community.” Ten years later, her vast fortune and eminent title enabled her to make a pageant of England’s foremost natural philosophers, both in print and in their own college. Thus, her fiercest attacks on the Royal Society came not from the margins of society, but from its very centre.

3. **Leviathan** and the Authoritarian Nature of *Blazing World*

Cavendish’s natural philosophy is steeped in authoritarian politics, borrowing heavily from the Hobbesian ideal of a supreme monarchy. Her eccentric writing and dynamic conception of nature has obscured the serious political engagement of her whimsical fantasy, *Blazing World*. Her capricious style of writing has led scholars to lament that “there seems little hope—or, probably point—of attempting to define a consistent core of political values.” However, Deborah Boyle successfully challenges this assertion, finding an ongoing preoccupation with the Hobbesian doctrine of self-interest. Crucially, Boyle notes, Cavendish shares the view that mankind is in a state of perpetual struggle and requires what Hobbes calls “a common Power to keep them all in awe.” Hobbes’s influence on Cavendish’s political writing is well documented, but little consideration has been given to the structural influence of the *Leviathan* metaphor on


53 Smith, 153.

Cavendish’s vision of Nature. While Cavendish objects to particular elements of Hobbes’s treatise, she appropriates his basic conception of the state as *Prima Homine*, but recasts Nature as the ultimate political body. In so doing, she brings the discourse of civil governance into realms of natural philosophy and fantasy, where she can most easily claim authority, and where she can critique experimental science as an urgent political matter.

Cavendish first reframes the political philosophy of *Leviathan* as a matter of natural philosophy in her *Philosophical Letters*. Specifically, she addresses Hobbes’s vision of the state as a monolithic body that regulates the behaviour of its constituent “*Matter […] and* Artificer; both of which is Man.” With feigned modesty she declines to comment on his politics in part because “a Woman is not imployed in State Affairs, unless an absolute Queen” (47). Rather, she proffers opinions on the functionally identical matter of his “Natural Philosophy” (47). She disputes his above assertion on the grounds that “Art cannot make unity amongst [men], or associate them into one Politick body” (47). She continues, “it is not artificial form that governs men in Politick Government, but a natural power” (48). Yet, as she argues in *Blazing World*, it is most “natural for a politic body to have but one governor,” of which “monarchy is [the] divine form” (19). This semantic sleight of hand effectively re-inscribes the divine right of monarchy by way of the transcendent order of nature.

Cavendish’s post-atomist philosophy posits nature as a single, unified, body, composed of sensitive matter, inanimate matter, and rational matter. Her radically materialist philosophy denies the possibility of non-matter, and further argues that, since everything is material, all active matter must necessarily be self-moving. Her system affords a small space for an omnipotent God, whose role she confines to creator; but it is the monarch Nature who orders and governs. Cavendish rejects the Royal Society’s philosophy that you can know an object by its surface, which, she claims, “is straightforwardly unable to account for the orderliness of


nature.”\textsuperscript{57} Her natural philosophy blurs into political philosophy when she asserts the fundamental limitations of human knowledge. As she states, “[Nature’s] finite Parts, or particular Creatures, cannot have a general or infinite Knowledge, being limited, by being finite, to finite Perceptions, or perceptive Knowledge.”\textsuperscript{58} Thus, her position that nature cannot be known arises “out of a belief that man is inextricably \textit{a part} of the nature he seeks to know: there simply exists no outside vantage point from which to view and thereby to control some object called nature.”\textsuperscript{59} The social politics of Cavendish’s philosophical model are readily apparent. Each person is only a small part of a massive hierarchy, and their functions are determined by innate, hereditary, qualities.

\textit{Blazing World}’s satire of Royal Society science is a key element in its larger project to reinforce the prescribed order of Nature. The story announces its political intentions from the opening episode involving a crime of unnatural ambition. A foreign merchant becomes infatuated with a beautiful young lady—significantly, Cavendish only ever refers to her characters by title or rank—but he is “beneath her in birth and wealth [and thus has] little hopes of obtaining his desires” (7). Overcome by these desires, the merchant steals the lady away aboard his ship. This abduction is the most dramatic instance of men attempting to violate the natural order, but similar in kind to later instances of mechanical philosophers attempting to augment their natural deficiencies. The Lady’s initial peril is more than just a romantic trope. For those familiar with Cavendish’s corpus it evokes a favourite metaphor of mechanical philosophy as a kind of rape. For instance, her descriptions of science in \textit{Philosophical Letters} are replete with images of sexual violence. Condemning the various branches of natural philosophy, she writes that “Mathematicians […] endeavour to enchant Nature with Circles, and “Geometricians do press and squeeze her so hard and close, as they do almost stifle her” (490). Yet she also imbues nature with a far greater agency than is permitted by most gentlemen of science. In another letter she scoffs at Jean Baptiste van Helmont’s claim that Nature was once “a beautiful virgin,” but now, 


\textsuperscript{58} Margaret Cavendish, \textit{Grounds of Natural Philosophy} (London, 1668), 24.

\textsuperscript{59} Keller, 457.
defiled by the sin of man, requires his science to “purge the guilt.” This, she replies, is “too great a presumption and arrogancy […]. Since man] is but a small finite part of Infinite Nature, and almost Nothing in comparison to it” (279). Nature exercises her infinite power in *Blazing World* and raises “such a tempest” against this presumptuous merchant that his vessel is “carried as swift as an arrow out of a bow, towards the North Pole” (7). The merchant and his men succumb to the deadly cold, while the Lady is spared.

The Lady is rescued from the ice by a troop of bear-men, and brought to the Blazing World’s imperial capital where she is quickly crowned Empress. The remainder of the first section follows her discourses with the “several sorts of men” that comprise her subjects (17). Cavendish deliberately employs the language of “sorts” to demarcate the strange creatures of her land. During the seventeenth century, the term “sort” carried multiple meanings, which overlap in the *Blazing World*. The word might refer to a species or kind, but it might also refer to a person’s social rank. Cavendish uses both senses simultaneously when describing the anthropomorphic animals that populate her world, and the occupations proper to them. The verbose, “jackdaw-, magpie- and parrot-men” are the Empress’s orators and logicians, the cunning “fox-men her politicians,” and so forth (17). Cavendish is far less generous in sorting her men of science. Her experimental philosophers are cantankerous bear-men; among her natural philosophers are myopic worm-men; and her chemists are ape-men, presumably implying that their science only mimics rational philosophy. Among the classifications that may seem opaque to a modern reader are the fly-men and louse-men, who serve respectively as natural philosophers and mathematicians. These, her contemporaries would readily recognize, are a sardonic reference to iconic images from *Micrographia*, the Royal Society’s most famous production next to Boyle’s air-pump.

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60 Jean Baptiste van Helmont, *Van Helmont’s Works Containing His Most Excellent Philosophy, Physick, Chirurgery, [and] Anatomy* (London, 1664), 231.


In the ensuing discourse between the Empress and her scientists, Cavendish refutes standard claims that science might benefit a nation, and counters with her own claims that such experiments are harmful to the body politic. Anticipating Cavendish’s Gresham visit, the Empress indulges her bestial scientist in a demonstration of their philosophical instruments. But when the worm-men allow her to view a flea and a louse under the microscope she is unimpressed by the display. Instead she is moved to pity “those that are molested by them, especially poor beggars,” who have no food themselves, but are “necessitated to maintain and feed of their own flesh and blood, a company of such terrible creatures called lice” (30). She then pointedly asks whether their glasses can hinder “their biting, or at least show some means to avoid them” (30). To this they reply that “such arts [are] mechanical and below the noble study of microscopical observation” (30). Their phrase “noble study” is doubly ironic, both because it underscores the lowness of the mechanical arts, and because many of her experimenters are themselves those “terrible creatures called lice.” Thus, she quietly refigures her scientists—and by extension, the Royal Society after which they are modelled—as self-indulgent parasites. The Empress likewise belittles the telescopic classes of her bear-men, but instead of making the minor complaint of triviality, she boldly accuses their machines of being politically divisive.

Initially optimistic about the practical value of such instruments, the Empress commands the bear-men to “go with their telescopes to the very end of the Pole that was joined to the world she came from, and try whether they could perceive any stars in it” (27). They comply and return to tell of the celestial wonders they have witnessed, but their accounts contradict each other. Echoing disputes of Cavendish’s day, some astronomers report “that they had seen three blazing-stars” while others “said it was but one star.” They argue at length until the Empress grows “angry at their telescopes, that they could give no better intelligence,” and finally declares, “I do plainly perceive, that your glasses are false informers, and instead of discovering the truth, [delude] your senses” (27). The Empress commands them to break their telescopes and “let the

63 “A reference to debates surrounding the observation of comets in 1572, by Tycho Brahe, and in 1604” (James, 27n).

64 Cavendish makes the same point in *Observations* when she writes that “artificial instruments, as microscopes, telescopes, and the like, which are now so highly applauded [are] deluders, rather than true informers. The truth is, there’s not anything that has, and doth still delude most men’s understandings more, than that they do not consider the variety of nature’s actions, as they do their senses” (99).
bird-men trust only to their natural eyes, and examine celestial objects by the motions of their own sense and reason” (27). The bear-men plead that she allow them to keep their telescopes, arguing not that she has overlooked some value in the instruments, but that they are natural pedants, and the glasses encourage the fruitless debates in which they so delight (28). The Empress concedes “upon condition, that their disputes and quarrels should remain within their schools, and cause no factions or disturbances in state or government” (28).

But does the Empress’s reproof of her bear-men convey a genuine concern that the uncertain knowledge produced by science will cause fractures in the body of state? The broad consensus is that the exchange dramatizes a political idea, which is incommensurable with a scientific worldview. As one scholar claims, the episode endorses a pre-scientific conception of “civic humanism […] which treats human affairs, political and economic, in accordance with a presumed law of the universe.”65 Any mode of inquiry that cannot provide consensus about these laws must be quarantined from political society. It is similarly affirmed that Cavendish’s politics were rooted in nostalgia for the pragmatism of Elizabeth I.66 Thus, when the Empress banishes her bear-men from government, the reader is meant to infer the lesson that a prudent ruler ought to “exchange his learned societies for capable counsellors.”67 Such readings, however, are apt to miss the calculated theatricality of the episode. Her chastening visit to this virtual Gresham has no practical impact on its sciences. She neither terminates, nor even attempts to influence their studies, but merely forces her scientists to supplicate before her, and beg that she permit them to continue their pursuits. This performance literally brings her scientists to their knees, while allowing the Empress full advantages of their productions. As we learn, she is well aware of their strategic value.

In one of the many instances in which Blazing World renders the boundaries between fiction and reality porous, England is threatened by an invading fleet, and the Duchess (Cavendish) calls


66 Susan James, Political Writings, xxi. For more on Cavendish and the cult of Elizabeth, see Claire Jowitt, “Imperial dreams? Margaret Cavendish and the cult of Elizabeth,” Women's Writing 4.3 (1997): 383-399.

67 James, xxi.
upon the Empress for aid. The Empress acknowledges the potency of her society’s advanced technology, when she deploys it against England’s enemies. The glasses, which she had early ordered to be broken, immediately prove useful in gathering crucial intelligence, as “the bear-men through their telescopes discovered a great number of ships which had beset all that kingdom, well rigged and manned” (94). Cavendish delves even further into the realm of what we now call science fiction when the Duchess tells the Empress’s shipwrights “how some in her own world had been so ingenious, and contrived ships that could swim under water, and asked whether they would do the like” (92). Though submarines would not see combat for over a century, many of Cavendish’s forward-thinking contemporaries recognized their military potential, including her correspondent Constantijn Huygens, who had written that “it is not hard to imagine what would be the usefulness of this bold invention in time of war.” Members of the Royal Society were similarly optimistic about the potential uses of such vessels. As founding member John Wilkins speculated, such an invention “may be of very great advantage against a Navy of enemies, who by this means may be undermined in the water and blown up.” The Empress’s submarines then vindicate the Royal Society, as the soldiers of the Blazing World make great advantage of the ships “which the giants had so artificially contrived, that they were therein found no inconveniency at all” (94). The fleet terrifies the enemy, who, after a single battle, surrenders unconditionally to the technologically advanced military.

Readings that are invested in placing Cavendish on the political margins have difficulty reconciling her presumed opposition to science with her ensuing power fantasy. As Rachel Trubowitz argues, *Blazing World* offers a radical challenge to the Baconian programme, which seeks “to enlist science to enter nature ‘like a general who means to take possession,’” whereas Cavendish “confines her heroine’s scientific interests to non-invasive speculation and reflection.” Thus, the Empress’s uncoupling of science from politics is a key element in her

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agenda of replacing “the ‘Tyrannical Government’ of men,” with “a magical and mythological mode of female rule.” Yet this generously overlooks the fact that the Empress’s mechanized army facilitates England’s tyrannical rule over the entire globe.

Emboldened by the rout, the Empress sets her designs on “making [Charles] the most powerful monarch of all that world” (98). In the same manner in which she destroyed the invading fleet, the Empress’s forces lay waste to Europe’s various merchant navies until England’s “neighbouring nations [found] themselves so much enslaved, that they […] all agreed to join their forces against the King” (98). However, even this grand coalition of Europe’s primitive armies is unable to withstand the Empress’s advanced technologies or her ruthless tactics. She warns the princes and sovereigns of Europe that “she would give them a proof of her power, and check their obstinacies by burning some of their smaller towns” (99). When they refuse to capitulate, she again puts her bear-men’s instruments to use, having them “view through their telescopes what towns and cities those were that would not submit” (99). As promised she puts these towns to flame, and before long, all nations submit, and the Duchess declares England “absolute monarchy of all the world” (100).

This despotic fantasy is a problem for those wishing to ascribe to Cavendish a milder disposition than her Royal Society contemporaries. Trubowitz reads the episode with regret as the socially determined outcome of Cavendish’s conflicting ideologies, between her “feminine” naturalism and “masculine” royalism. In the end, she claims, the Duchess’s desire for natural harmony is “undermined by her aristocratic investment in monarchy or, more precisely, by her adoption of the patriarchal ethos of absolutism.” Yet this resolution assumes a conflict that only exists when we approach her attacks on the Royal Society as attacks on science. When we recognize the Empress’s censure of her natural philosophers as an act of domination—of fettering her scientists, but not their productions—the apparent contradiction with her military aggression vanishes. Her criticisms of scientific epistemology and the impracticability of its productions

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71 Trubowitz, 231.

72 Trubowitz, 241.
belie her real project, to prevent it from gaining the autonomy of a genteel philosophy, and rather to subordinate its productions to the interests of the state.

The military conquest in which the story culminates demonstrates a clear lack of conviction in Cavendish’s claims that natural philosophy is without utility. Rather, as Sarasohn observes, it confirms a belief “that experimenters, chemists, and astronomers can function intelligently and usefully if they are governed by a wise and ambitious ruler.”\textsuperscript{73} In other words, it was not the practice of natural philosophy that made Cavendish uneasy, but rather the social character of the practitioners. Her real problem with Royal Society was that they refused to subordinate themselves to the established political hierarchy, but instead attempted to fashion themselves as an autonomous society of noble philosophers. As petty as this attitude may seem in retrospect, it was not unique to Cavendish. It was widely enough held that the Royal Society actively campaigned to legitimize themselves as a genteel organization. A major element in this campaign was to establish Robert Boyle—seventh son of the first Earl of Cork—as their aristocratic figurehead. Boyle clearly understood the gravity of this role, which is why his scientific writing was so preoccupied with affirming the respectability of the Society’s members.

In order to fashion himself as a paradigmatic gentleman scholar, it was crucial for Boyle distinguish Royal Society philosophers from pedant-scholars and pharmacists. Efforts to do so are readily apparent in his pioneering philosophical dialogues, published in 1661 as \textit{The Sceptical Chymist}. One of the book’s most striking elements is the bare, straight-forward, style, which Boyle deliberately contrasts with abstruse scholastic prose. Conscious of the social implication of his style, he declares that it is “fit that in a book written by a gentleman, and wherein only Gentlemen are introduc’d as Speakers, the Language should be more smooth and the Expressions more civil than is usual in the more Scholastick way of writing.”\textsuperscript{74} Popular narratives have long claimed that \textit{The Sceptical Chymist} “open[ed] the way to modern chemistry by sweeping away misguided alchemy.”\textsuperscript{75} However, historians of science now recognize that

\textsuperscript{73} Sarasohn, \textit{Natural Philosophy} 153.

\textsuperscript{74} Robert Boyle, \textit{The Sceptical Chymist: Reprint of a 1661 Edition} (Kila MT: Kessinger, 1992), Preface, A6r.

Boyle’s target was not alchemy, “which continued to inform his “science.”” Rather, Boyle intended to differentiate his science from the commercial enterprise of chemistry. It is with this in mind that Boyle writes, “much I shall make bold to add, that we shall much undervalue Chymistry, if we imagine, that it cannot teach us things farr more useful, not only to Physick but to Philosophy, than those that are hitherto known to vulgar Chymists.” Thus Boyle deftly links the dual obstacles of utility and class, implying that chemistry is only useless because “vulgar Chymists” have heretofore claimed exclusive dominion over the practice. In the right hands, there would be no limit to its productive capacity and value.

But if chemistry were to earn its place among the serious branches of philosophy, wresting it from the coarse hands of chemists was only the first step. Boyle’s next task would be to frame it as a science suitable to those of high social status. As Steven Shapin tells us, “a major (and, perhaps, the major) problem for the proponents of the new scientific practice was the exhibition of its suitability for a gentleman.” In order to make this possible, the Royal Society had to perform a kind of rhetorical alchemy, distilling the essential study of chemicals from the crude material of working chemists. To this end, Boyle’s account of his chemical apprenticeship places as much emphasis on what he did not learn from his teachers as what he did, stressing, for example, that he “had the good fortune to Learn the Operations from illiterate Persons, upon whose credit I was not Tempted to take up any opinion about them.” Unfortunately for Boyle and his colleagues, this type of rhetorical gesture, which was necessary for natural philosophy to overcome its social stigma, created a paradox in identification. The distinction that Boyle draws between chemistry and chemists applies just as well to himself, allowing him to be regarded not as a gentleman-scientist, but as a gentleman who happens to do science.

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77 Boyle, Sceptical Chymist, Preface, A7v.


79 Boyle, Sceptical Chymist, Preface, A8r.
Cavendish picks up on this contradiction when she refers to “that Learned and Ingenious writer B[oyle]” who, she observes, “is a very civil, eloquent, and rational writer; the truth is, his style is a Gentleman’s style”; however, she suggests that his experiments might be more beneficial if he were to study causes rather than effects. While far from her most devastating criticism of natural philosophy, this passage is nonetheless significant in its implication that Boyle’s genteel authority is not transferable to his role as experimenter. Contained within this seemingly incidental critique of Boyle’s experimental objectives is a key failing of the bid to elevate the status of natural philosophy. The larger culture was unwilling to expand social repertoires to include the gentleman-scholar, though most overt criticisms were couched in challenges to the utility of science.

4. Ignoble Artists and the Rhetoric of Utility

The Royal Society was itself partially to blame for making utility such an enticing point of attack. In its various campaigns for legitimacy, and more importantly funding, Society spokesmen frequently played up the prosperity their studies would one day bring. In his History of the Royal Society (1667), for instance, Thomas Sprat ambitiously declares that, “While the Old could only bestow on us some barren Terms and Notions, the New shall impart to us the uses of all the Creatures, and shall inrich us with all the Benefits of Fruitfulness and Plenty.” Boyle takes a similar position when he proclaims it is “usefulness [that] so highly recommends philosophy to me,” and he goes on to state that he would dare not “assume the title of naturalist ’til the productions of my garden, orchards, or fields, exceed those of others unacquainted in this study.” With so much resting on the promise of material benefits, it is little wonder that Cavendish and others would seek to exploit these yet unfulfilled promises.

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80 Cavendish, Philosophical Letters 495.

81 Cavendish, Philosophical Letters 496.


As with most early critics of the Royal Society, Cavendish held science to an impossible standard of usefulness and then attacked it for failing to meet this standard. In an exemplary moment, *Observations* likens natural philosophy to a children’s game, comparing microscopists, atomists, and materialists, respectively, with, “boys that play with watery bubbles, fling dust into each other’s eyes, or make a hobbyhorse of snow” (52). The practitioners of such immature philosophy, she writes, “are worthy of reproof, rather than praise, for wasting their time with […] unprofitable arts” (52). Fellows of the Society were constantly defending themselves against such allegations. In a telling moment in his treatise on the usefulness of natural philosophy, Boyle assures readers that experiments are “not like the Tricks of Juglers or the Pageants that entertain Princes.”84 Embedded within this affirmation, however, is a deeper social tension. For scientists to establish themselves as properly genteel, they first had to convince people their work had value that transcended profit or personal interest. Conversely, detractors, such as Cavendish, exaggerated the novelty of science in order to reinforce the idea that mechanical philosophers were merely tradesmen or servants, whose sole occupation was to amuse their betters.85 In a sense, Boyle and Cavendish were both correct.

Seventeenth-century natural philosophy was philosophically and socially ill-defined, simultaneously regarded as a high-minded pursuit of useful knowledge, and yet another source of distraction for England’s pleasure-seeking elite. The Royal Society promoted itself as a body of philosophical gentlemen, and histories of science continue to emphasize the nobility of early members. Dwight Atkinson describes the first meeting of the Society as a “gathering of 115 gentlemen and aristocrats, including such notables as Robert Boyle, Robert Hooke, John Wilkins, Christopher Wren, and John Evelyn.”86 And, in a special report for the journal, *Science*, Jon Cohen pays tribute to self-financed scholars, like Boyle and Henry Cavendish, who shaped


85 Cavendish refers to mechanical philosophers as “servants” throughout her writing. She writes in *Observations*, for instance, “the artist or mechanic is but a servant to the student” (49). See also *Philosophical Letters* (502), above.

seventeenth-century science. Yet dedicated nobles such as these comprised a distinct minority of early scientists. Histories rarely acknowledge the fact that most early experimentalists were modish amateurs “demonstrate[ing] the kind of fashionable curiosity about natural phenomena expected of a Restoration gentleman.” Neither could the majority of Society members claim to be “gentlemen”, except in the loosest sense of the word.

Both members and detractors were acutely conscious that the Royal Society drew the bulk of its membership from the unheralded ranks. Recognizing that epistemological authority of science depended on the social status of its practitioners, Sprat insistently refers to members as “gentlemen” throughout his History. Only once does he concede the truth that “the Society entertains very many men of particular Professions,” but he quickly assures his reader that “the farr greater Number are Gentlemen, free, and unconfin’d.” In reality, only a third of its members were of the landed gentry. A third—including prominent members such as Robert Hooke and Sprat himself—were of the professional ranks. Most of the rest were bureaucrats or men otherwise employed by the government. Many regarded the Society as little more than a social club, which “represented the coming together of the higher echelons of London society rather than of men committed to advancing the new science.”

Triumphalist histories now praise the democratic makeup of the Society, which symbolized “the ease of intercourse between the different levels of English Society.” At the time, however, many wondered if the Society was merely an avenue for opportunistic social climbers to mix with the cultural elites.

Cavendish bristled at the social presumptions of low-born artists and experimenters. The most obvious and consistent target was Hooke, who represented to her an affront to traditional epistemic hierarchies. An Oxford-educated son of a minister, Hooke was not quite as low-born as

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89 Sprat, 67.

90 Keeble, 200.

his critics implied. However, the fact that he dirtied his hands with experiments was enough for Cavendish and others to relegate him to that class of “Mechanical Arts and Artists,” who—according to *The Compleat Gentleman* (1634), Henry Peachum’s authoritative manual of rank—“labour for their livelihood and gaine,” and thus “have no share at all in Nobility or Gentry.”

Hooke intended *Micrographia*, in part, as a statement of purpose for the experimental sciences, which attempted to wrest epistemic authority away from its traditional, scholastic, domain. In the Preface, he suggests that artisans and intellectual labourers alone hold the key to understanding the created world. One of the book’s most important claims is that scientific instruments have become so advanced as to be able to correct the post-lapsarian imperfections of our senses and allow us to see God’s world as we did before the Fall. As he writes, “by the addition of such artificial Instruments and methods, there may be, in some manner, a reparation made for the mischiefs, and imperfection, mankind has drawn upon it self.”

Beyond simply promising a more complete knowledge of the natural world, Hooke claims that “by rectifying the operations of the Sense, the Memory, and Reason […] all the light, by which our actions are to be guided, is to be renewed, and all our command over things is to be establishd.” *Observations* responds to this ambitious rhetoric of control, explicitly challenging the artisan’s claim to any privileged knowledge, asserting instead that it is improper for an artisan to claim any non-technical knowledge whatsoever.

This inexorable relationship between epistemic and social authority is one of *Observations*’s most prevalent themes. Cavendish foregrounds the competition between experimental and rational philosophy as a matter of rank in her address to her “Noble Lord” the Duke of Newcastle. While she praises his virtuoso interest in the science, she simultaneously affirms that his properly genteel interests make it impossible for him to practice crude mechanical arts:

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95. This is an unusual phrasing for Cavendish. While she dedicates most of her publications to her husband, she typically refers to him as “My Lord”. See for example, *Orations of Divers Sorts; Playes* (London: 1662); and *Sociable Letters*. She only includes “Noble” when his official status is relevant to the work, such as *The Life of the Thrice Noble, High and Puissant Prince William Cavendish* (London: 1667).
Though your Grace is not only a lover of viruosos, but a virtuoso yourself, and have as good, and as many sorts of optic glasses as anyone else; yet you do not busy yourself much with this brittle art, but employ most part of your time in the more noble and heroic art of horsemanship and weapons, as also in the sweet and delightful art of poetry, and in the useful art of architecture, etc. which shows that you do not believe much in the information of those optic glasses. (4)

The “brittle art” of experimentation appears throughout the book as a conveniently weak adversary for Cavendish’s rational philosophy. She invokes “art” as a pejorative concept to describe “irregular” perception and knowledge, “which is apt to delude sense, and cannot inform so well as reason doth” (47). In her system, all senses are deficient in so much as they are each limited to a single domain, and are thus apt to confuse and contradict. In political terms they are the lower orders whom reason rules like a monarch, reforming and instructing in all its actions (47).

In what is perhaps her most cogent rebuttal of microscopic science, Cavendish uses Hooke’s own account of his illustrative process to refute his claim of observational neutrality. *Micrographia* concedes that “there is much more difficulty to discover the true shape than those visible to the naked eye.” In the poetical language with which he describes his favourite subjects, insects, he writes that under a microscope, “the eyes of a fly in one kind of light appear almost like a lattice, drilled through with abundance of small holes […] but] in the sunshine they look like a surface covered with golden nails.”96 To this Cavendish replies that “artists do confess themselves that flies, and the like, will appear of several figures or shapes, according to the several reflexions, refractions, mediums and positions of several lights.” This being the case, she asks “how can they tell or judge which is the truest light, position, or medium, that doth present the object naturally as it is?” (51). She stresses the creativity required in order to produce a supposedly objective image of nature’s parts. Thus she implies that the apparent neutrality of Royal Society belies an impulse to dictate the terms in which nature is understood, rather than simply record the facts of nature. This creative impulse has very tangible implications for culture whose social

order depends largely on the notion that an immutable hierarchy is the most natural form of
government. In an age of mechanical philosophy, however, “the [art] is become rather vain than
profitable, striving to act beyond her power” (201). Likewise, she implies, the mechanics of the
Royal Society are striving to act beyond their power.

“Like a high heel to a short leg,” Cavendish writes, dioptrical instruments artificially elevate
those whom nature has properly limited (52). This is as much a political claim as it is a
philosophical one. While the military episode in Blazing World implies that scientific instruments
are acceptable only when put into service of an absolute monarch, Observations makes this claim
explicit. Cavendish once more concedes that experimentation does have a role in natural
philosophy; however, she deliberately employs the language of social hierarchy in order to refute
Hooke’s claim that mechanical experimentation can reinvigorate the science of nature, which, as
he writes, “has been already too long made only a work of the Brain and the Fancy.” To this
Cavendish replies that rationality dominates natural philosophy whether or not Hooke and the
Society care to admit it. As she writes, “experimental and mechanical philosophy cannot be
above the speculative part, by reason most experiments have their rise from the speculative, so
that the artist or mechanic is but a servant to the student” (49). Her recurring analogy between
mechanic and servant is only ever partially metaphorical. In some instances, the hierarchical
relationship between reason and sense (including artificial or prosthetic senses) is a
predominantly figurative trope, as when she writes “sense is only a workman, and reason is the
designer and surveyor; and as reason guides and directs, so ought sense to work” (99). In other
instances, however, the same relationship between reason and sense begins to lose much of its
metaphorical quality, as when she asserts that “so much as the rational knowledge is more noble
than the sensitive, so much is the speculative part of philosophy more noble than the mechanical”
(196). The indeterminacy of this rhetorical figure bespeaks an anxiety about the uncertain role
Hooke and his ilk intend to occupy in England’s social hierarchies.

In her moments of greatest apprehension, she presents mechanical philosophers as insurgents
against aristocratic hierarchies of knowledge, regarding any model of nature that does not mirror

97 Hooke, Micrographia, Preface, B1r.
England’s monarchical structure as potentially dangerous to the nation’s stability. While experimental philosophy was never strongly associated with any religious sect or political party, she draws disquieting parallels between mechanical scientists and Puritan Revolutionaries. The same rebellious spirit that prompts one group to deny nature’s true monarchy prompts the other to deny man’s true monarchy. She goes so far in Observations to liken the Society philosophers to “those unconscionable men in civil wars, which endeavour to pull down the hereditary mansions of noblemen and gentlemen to build a cottage of their own” (8). This bitter passage recalls Cavendish’s personal experience of the war wherein her own hereditary mansion was destroyed by Parliamentary soldiers, the entombed bodies of her recently deceased mother and sister desecrated, and her brother executed. The comparison is almost laughably hyperbolic, but it bespeaks a profound anxiety about the consequences mechanical science on political life.

The prospect of the aristocracy losing its social monopoly was never realistic, as, even throughout the eighteenth century, “English society witnessed relatively little movement from the upper-middle orders to the nobility, or from the service and labouring orders to the middle ranks.”98 For conservatives such as Cavendish, however, social mobility posed an imminent threat to political stability, and the mechanical scientist became an emblematic figure of this mobility. Robert Hooke was one of very few men to make his living as a practicing scientist. There were in fact so few professional scientists in the seventeenth- and early-eighteenth centuries that they did not rate their own formal category in manuals of rank. Rather than assuaging anxieties, however, this indeterminacy compounded the suspicion with which they were regarded. They were most easily slotted in with the working trades, but they traded in knowledge, situated them higher than other labourers, and the nature of their trade elevated them to the level of colleague with gentleman philosophers.

Joseph Addison comes close to articulating Cavendish’s apprehensions about these uppish professions when, in a satire of England’s many manuals on social rank, he writes:

I come now to that Point of Precedency which is settled among the three Learned Professions, by the Wisdom of our Laws. I need not here take Notice of the Rank which is allotted to every Doctor in each of these Professions, who are all of them, though not so high as Knights, yet a Degree above Squires; this last Order of Men being the illiterate Body of the Nation are consequently thrown together into a Class below the three Learned Professions.99

The three learned professions to which Addison refers are clergy, law, and medicine. He probably did not have natural philosophy in mind, except perhaps to the extent that it was already permeating the first and last of these categories. More broadly, however, he gestures to the possibility that intellectual labour may one day eclipse hereditary status, and when the epistemic authority of an experimenter may one day eclipse the rational authority of a noble. This is precisely the scenario that Cavendish had envisioned a half century earlier in Observations, only her scenario is not a joke. As she writes, a society that strays from nature’s hierarchies by placing too much authority in the hands of experimenters leads to governance by mechanics, wherein “the bare authority of an experimental philosopher is sufficient to them to decide all controversies, and to pronounce the truth without any appeal to reason” (197).

Cavendish was deeply suspicious about this potential democratization of knowledge, that soon the “bare authority” of manual labourers might topple traditional pillars of authority. Were she alone in her suspicion, the Royal Society would not have had such difficulty establishing itself as a genteel body. The early years of the Society can, in a sense, be regarded as a competition for who was to be the face of science, the aristocratic philosopher, Robert Boyle, or the apparently low mechanic, Robert Hooke. Eventually, Boyle would triumph, alongside Isaac Newton, as the paradigmatic gentleman scientist. But this was no sure bet during Cavendish’s lifetime and even less so when, soon after her death, Nicholas Gimcrack (and, for a brief time, John Woodward) displaced Hooke in the popular imagination as the archetypical burlesque natural philosopher.

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Chapter 2
Woodward and the Scriblerians

If burlesque natural philosophers never really existed, then (to borrow Voltaire’s phrasing) it would have been necessary for satirists to invent one. Fortunately for them, there existed Dr. John Woodward (1665/1668-1728), Gresham professor of physick, member of the Royal Society and Royal College of Physicians, and real-life Nicholas Gimcrack figure.¹ A scientific visionary of boundless energy, Woodward ran a lucrative medical practice, performed chemical experiments, and conducted the first quantitative analysis on the relationship between plants and water.² Of all his scientific projects, however, he was most famous for his vast antiquary collection of coins, pottery, and other relics, as well as what one of his contemporaries referred to as “the noblest collection of fossils of all sorts that I ever saw.”³ Woodward’s account of this collection—including general rules for assessing and curating artifacts—formed the basis of a two-volume *Attempt towards a Natural History of Fossils* (pub. 1728, 1729), which helped give rise to modern fossil theory. Woodward bequeathed his antiquarian collection to Cambridge University, along with a sizable financial endowment, securing, he believed, a dignified legacy in form of the Woodwardian Chair of Geology. His real legacy, however, was considerably less dignified than he hoped.

When Woodward is remembered today, it is usually for the many literary caricatures he inspired, particularly, though not exclusively, among the so-called Scriblerians, especially John Arbuthnot, John Gay, Alexander Pope, and Jonathan Swift. Woodward was burlesqued in such works as the *Memoirs of Martinus Scriblerus* (pub. 1741), *Three Hours after Marriage* (1717), *Annum Mirabilis* (1722), and the follow-up poem, “An Epistle to the most Learned Doctor W--d----d” (1723), with glancing mentions in *Gulliver’s Travels* (1726), and *The New Dunciad*, later *The

¹ See Introduction for the influence of Nicholas Gimcrack on seventeenth- and eighteenth-century attitudes towards science.


³ Porter, 338.
Dunciad in Four Books (1742, 1743). These earned him the unenviable distinction of being the individual most frequently mocked by that satirical coterie, collectively and in their individual works. As often as not, however, these satires exaggerated, or misrepresented, his character and interests to such an extent that it is doubtful whether some of them should even be regarded as satires of Woodward himself. As this chapter argues, satirists constructed Woodward to embody the follies of modern science and modernity in general, but, by so doing, they created a negative space around him in order to explore more hopeful aspects of modernity.

Woodward was largely forgotten after his death, and his impact on modern science might remain obscure if not for Joseph Levine’s superb biography Dr. Woodward’s Shield: History, Science, and Satire in Augustan England. Levine’s book is still the most authoritative source on Woodward and many of his contemporary second-tier scientists. However, it does little to elucidate the relationship between science and satire promised in the subtitle. Rather than asking what motivated so much hostility, the book presumes a natural animosity “between two intellectual communities, the virtuosi and the wits.” But as scholarship renders this binary conflict increasingly unsupportable, it becomes clear that Woodward’s infamy was overdetermined by numerous personal, professional, and political factors. Levine is partially correct that Woodward came to represent the over-reaching ambitions of modern science, but while “ancient” and “modern” were important ideological categories, frequently invoked by the literati of his age, the categories were no more stable in Woodward’s time than they are today. In a later publication, Levine himself recognizes a symbiosis between the scholarly modes, as champions of ancient learning drew upon modern antiquarian and philological studies in order to render the past legible. Few opposed all aspects of science, just as few opposed all aspects of the material culture within which it was bound. Rather than representing science and/or modernity in some absolute sense, Woodward was made a fluid signifier for the undesirable

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5 Levine, 2.

aspects of modernity, whatever those might be. Satirists, and even his fellow scientists, chose Woodward, for a variety of reasons, to epitomize the vices and follies of modern society, and by so doing allowed themselves to embrace the facets of which they approved.

Woodward’s arrogant, quarrelsome, demeanour made enemies of his colleagues, and invited charges of scientific hubris from the laity. He was by all accounts an easy man to dislike. Moreover, his scientific theories were as prone to absurdity as they were to brilliance. His *Essay toward a Natural History of the Earth* (1695), for instance, accounts for fossils and mineral strata as by-products of Noah’s flood, at which time, he explains, a universal solvent bubbled up from the earth’s core, disintegrated most organic matter, and pulled the detritus underground as the liquid receded. He claims in the preamble to have derived his theory from “a long Train of Evidence.”

It is, however, rather obviously the product of a cursory understanding of gravity, an expedient interpretation of the Pentateuch, and a generous portion of fancy. *Natural History of the Earth* was justifiably mocked by Woodward’s contemporaries, including Bishop William Nicolson, who dubbed it the “Hasty-Pudding-Doctrine.” As *Tauronomachia*, an anonymous satire of Woodward from 1719, demonstrates, the culinary analogy would bedevil *Natural History of the Earth* for decades until the book dissolved from cultural memory:

Thus I’ve observ’d pro re natâ

A Kitchin wench of Bread lay *Strata*

Eggs, Suet and Plums in plenteous store,

But in a moment of an hour

Milk in a *Deluge* vast comes flowing

And dissipates all she’d been doing

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But when the Streams began t’asswage,

And quiet grow, and free from Rage;

Then, to my Sorrow have I spy’d

Whole Troops of Plums with speed subside.  

Woodward’s philosophy of medicine, which he intended to displace outmoded humoristic theories, was as outlandish as his account of the deluge. Contrary to the received wisdom of the ancients, he proclaimed that most disease—from madness to smallpox—resulted from an over-accumulation of bilious salts in the body. Thus, he argued, conventional treatments such as blood-letting did nothing to remedy illness, which was better treated via oral purgation: “the more powerfully the Vomit casts up the Bilious Matter, the better.” Woodward’s “vomiting cure,” particularly as it related to smallpox treatment, led to an increasingly heated print war with other physicians, and culminated in a violent confrontation on the steps of Gresham College in 1719, wherein his colleague Richard Mead nearly skewered him on his sword.

Perhaps as damaging to Woodward’s reputation as any of his particular theories, however, was how closely his early career aligned with the so-called Battle of the Books, waged in the late seventeenth and early eighteenth centuries. Beginning in the Renaissance, questions of how to recover the humanistic values of antiquity created cultural schisms in Europe and, eventually, England, with two broad camps emerging: the “ancients”, who advocated imitating classical texts as a means of discovering the universal truths behind them, and the “moderns”, who advocated new modes of philology and archaeology, in order to better understand the context in which these texts were produced. During the seventeenth century, these debates grew to encompass previously unrelated facets of modern life, including government and science. By the eighteenth century, the original purpose of the debate had become diluted, and the terms took on a broader rhetorical currency. One’s affiliation with “ancient” or “modern” values was largely an


ideological signifier, and both terms—but especially “modern”—were hurled as catchall pejoratives. Like all virtuosi, Levine claims, “[Woodward] threw in his lot with the moderns from the first.”

However, this generalization is based more on contemporary perception than on historical fact.

Woodward never publicly skirmished with the ancients, nor did most scientists of his generation. Rather, his admiration for Francis Bacon, one-time friendship with William Wotton, author of the inflammatory *Reflections upon Ancient and Modern Learning* (1694, 1697), combined with the nature of Woodward’s profession was enough for many to place him in the moderns’ camp. But while *Natural History of the Earth* champions the scientific method, such as it was, the essay is remarkably conciliatory on (or, rather, uninterested in) the cultural debate. It appeals instead to “the common Sense of Mankind, who are the true and proper Judges in the Case; both Ancients and Moderns, giving their Suffrages unanimously.”

Despite such sentiments, Woodward was immediately aligned with a modern, non-aristocratic, mode of literary and philosophical aesthetics. This, alongside his status as a professional scientist from a middling family—not, as Thomas Sprat would prefer, a gentleman “free, and unconfin’d”—made him an ideal figure to fuse improbable connections between various manifestations of perceived cultural degradation, from empirical philosophy to a mercenary print market.

Woodward attracted satirical animus because he exemplified a new type of man, who was regarded by many as an imminent threat to England’s traditional values. However, this figure simultaneously served a positive function for his detractors. As a universal antagonist, it lent coherence to an early-eighteenth-century literary attitude, which has traditionally been termed “Scriblerian”. Brean Hamond offers a simple, but potentially useful, definition of this Woodwardian type, which he describes as “a species both produced by and producing the new

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scientific learning, but at a cost to fundamental humanity, to naturalness, and to good writing.”

According to Hammond, this figure stood at the far end of “a widening gap between polite letters and more scientific ‘professional’ research conducted by members of the Royal Society.”

Scholars have rightly challenged Hammond for his straightforward dichotomy between men of letters and men of science, and for incautiously reifying the “Scriblerian” category. Ashley Marshall zealously opposes the notion of a “Scriblerian enterprise,” or reading the satires of Gay, Pope, and Swift as “manifestations of a shared satiric impulse.” She is, of course, right to alert us to the dangers of placing too much emphasis on a partially anachronistic designation, but she overstates her case against the term. Henry Power offers ample documentation to prove that “Scriblerian” did indeed hold meaning in the eighteenth century, and that Scriblerian works helped shape the way people thought about “literary production and about classical imitation.” However, Marshall and Power both agree that Hammond is too ambitious in proposing “Scriblerian” as a satirical mode, like Menippean, which might be applied to authors such as Vladimir Nabokov or Jorge Luis Borges. While this may be the case, the Scriblerian coterie, and their imitators, did indeed affect an opposition to scientific values, which they represented in the cartoonish figure of Woodward. However, this affectation obscured much more complicated feelings about science and modernity.

1. Woodward as the Ideal Natural Philosopher

Part of what made Woodward ideal for the role of real-life burlesque natural philosopher was that he never quite achieved greatness, but he occasionally approached it. Mediocre scientists were apt to go unnoticed by satirists. However, truly brilliant scientists like Boyle and Newton were nearly impervious to censure, despite the fact that both men devoted much of their “scientific” energies to esoteric studies like alchemy and astrology. Woodward’s theories were not strong


15 Hammond, 118.


enough to inoculate him against the attacks his personal and professional shortcomings invited, but they were strong enough to earn him prominence. *Natural History of the Earth* remained a formidable text throughout the eighteenth century, and was translated into Latin (1704), French (1735), Italian (1739), and German (1744). Indeed, Woodward probably deserves more credit than anyone for overturning the accepted belief that fossils were what renowned naturalist Robert Plot classified as *lapides sui generis*, stones shaped by God’s “most perfect Workmanship [. . .] for Mans delight.” Yet, few people were prepared to accept Woodward’s fanciful interpretation of scripture, which he tacked onto *Natural History of the Earth* to justify the claim that his strange rocks had once been plants and animals. Grand speculations such as his were conventional enough among scientific treatises, but this only contributed to his infamy. His many failures allowed him to stand in for all ambitious system-makers, who, as Arbuthnot writes in his *Examination of Dr. Woodward’s Account of the Deluge* (1697), were “apt to put more in the Conclusion than there is in the Premises.” Thus Woodward achieved an unfortunate balance of fame and folly, which satirists could easily exploit when they needed someone to personify the failures of modern philosophy and modernity in general.

In his notes to the *Memoirs of Martinus Scriblerus*, Charles Kerby-Miller suggests it was probably Arbuthnot who put Woodward forth as a model for their pedant, since Arbuthnot expressed his contempt for the doctor years earlier in his *Examination*, and continued to disparage him from then on. This supposition is plausible but uncertain, since Swift, at least, was also familiar with Woodward, who earns a passing mention in “The Windsor Prophecy” (1710). Swift playfully claims, in the preface, to have transcribed the poem from an ancient parchment, which “is now in the Hands of the Ingenious Dr. W------, F.R.S. where […]

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the Curious will not be refused the Satisfaction of seeing it.” However, neither Arbuthnot’s *Examination* nor Swift’s “Prophecy” is really necessary to explain how Woodward came to the club’s attention. He was already notorious for his colourful rows with Royal Society fellows, as when he demanded a colleague “Speak sense, or English,” during a 1710 Society meeting, from which he was summarily ejected. Word of the incident spread, and Swift was impressed enough with the bon mot to appropriate it for his essay, *The Public Spirit of the Whigs* (1714), wherein he writes, “The Author of the *Conduct of the Allies* writes Sense and English, neither of which the Author of the *Crisis* understands.” It would be improbable for one so polarizing to escape the notice of any Scriblerians by the time their club formed in 1714, particularly in light of a very public dispute over the authenticity of his prized “antique” shield.

The shield in question was one of Woodward’s favourite curiosities, and, as Levine meticulously explains, a rally point for those wishing to demonstrate the absurdity of modern learning.

Woodward purchased the ornate shield sometime in the late seventeenth century, convinced it was a relic of the Roman Empire. In 1706, he brought it to the attention of Thomas Hearne, an expert on ancient Rome, who eventually declared it fake. From there began a lengthy and fractious debate as to the shield’s authenticity, staged by antiquaries in correspondences, histories, and a number of popular publications. (Fortunately for Woodward, its Renaissance origins remained unproven during his lifetime.) The shield features prominently in Martinus Scriblerus’s inauspicious Christening, where the infant is first aligned with Woodward through the preeminent object of his folly. The proud Cornelius Scriblerus intends to exhibit his newborn...

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24 A few months before the Scriblerians’ first meeting, Henry Dodwell published *De Parma Equestri Woodwardiana Dissertatio*, a defense of Woodward’s shield, which firmly established the controversy as a matter of public interest. See Beattie, 218-223.

25 For a thorough account of the controversy see Levine, especially “Part Two: Dr. Woodward’s Shield,” 115-293.
in a manner befitting one “descended from a Race of Virtuosi” (102). He thus instructs his maid to lay the child on his antique shield, purchased “at the great (though indeed inadequate) expense of all the Plate of [his] family” (103). Unaware that the shield’s true value lay in its ancient rust, however, the fastidious maid scours away the “beautiful Varnish of Time” before presenting Martinus upon it (103). When the unveiling comes, Cornelius is aghast to see his treasure has been defiled. He trembles, and drops both shield and infant to the ground, crying out “O God! my Shield, my Shield!” (103).

Beyond an obvious illustration of the superficial values of antiquaries and empiricists, who care more for their trinkets than their own families, the episode introduces the ambiguous correspondences between the real Dr. Woodward, and his literary effigies. By staging Martinus’s symbolic nativity upon Woodward’s famous shield, the authors simultaneously establish commonality and distance between Woodward and Scriblerus. Readers are clearly meant to recognize Scriblerus as a neonate Woodward, but the Memoirs promptly uncouple them, when, unable to bear the sight of his despoiled shield, Cornelius had it sold to “Dr. Woodward, who, by the assistance of Mr. Kemp [antiquary John Kemp, F.R.S.] incrusted it with new rust,” and “exhibited [it] to the great Contention of the learned” (105). Woodward is thus acknowledged as an individual apart from Scriblerus. However, the accusation of charlatanry complicates the relationship, since not even Woodward’s harshest critics seriously accused him of fraud. He was, by this point, firmly slotted into the role of an enthusiastic system-maker who was far too credulous about his own flimsy theories. In this respect at least, the character of Scriblerus is actually truer to the real-life Dr. Woodward than is the literary Dr. Woodward of the Memoirs.

The relationship between Scriblerus and Woodward becomes truly muddled in the chapter upon the Discoveries and Works of the Great Scriblerus, wherein the authors enumerate Scriblerus’s most profound philosophical and mathematical works, relentlessly mocking all branches of Royal Society science (166-168). Several of Scriblerus’s works involve the kinds of mechanical experimentation for which the Royal Society was regularly satirized, but in which Woodward himself never engaged. These include a “Method to apply the Force arising from the immense Velocity of Light to mechanical purposes,” and “Microscopical Observations of the Figure and Bulk of the constituent Parts of all fluids.” Some are peripherally related to the theories in
Woodward’s *Natural History of the Earth*, including an “Investigation of the Quantity of real Matter in the Universe, with the proportion of the specific Gravity of solid Matter to that fluid.” And some of these works are obvious caricatures of Woodward’s science, as when the *Memoirs* credit Scriblerus with “all the new *Theories* of the *Deluge*.” Once again, though, the satirical coterie refuses a simple correspondence, and almost immediately unpurls Woodward from Scriblerus, by having the former project “a Menstruum to dissolve [a] Stone, made of Dr. Woodward’s *Universal Deluge-water*” (168). By perpetually engaging in this shell game with Woodward and his likenesses, the Scriblerians are at once able to ground their scientific burlesques in real and familiar practices, while providing themselves unbounded freedom to mock whatever sciences and pseudo-sciences catch their fancy.

The frequency with which the Scriblerians invoke Woodward has contributed to an exaggerated sense of their anxiety about science and modern learning, which, as Conal Condren asserts, they saw as denying the divinity in man and nature, and reducing the world to its material constituents. Allegations such as these retain a surprising amount of currency, despite significant evidence that the Scriblerians’ relationships with science (including the branch most closely associated with Woodward, antiquary studies) were far more nuanced than that of simple antagonism. Scholarship of this sort is conspicuously silent about the fact that Arbuthnot delved into antiquary studies with his book, *Tables of the Grecian, Roman, and Jewish Measures, Weights, and Coins* (1705), which he expanded and republished as *Tables of Ancient Coins, Weights, and Measures* (1727). Though Arbuthnot was the only Royal Society fellow among the Scriblerians, he was not the only one of them to recognize the merits of empirical science. As early as the 1960’s Marjorie Nicolson and G. S. Rousseau documented Pope’s profound interest in, and poetic engagement with, biology, geology, and, especially, medicine. More recently,

26 Kerby-Miller suggests the “[gall]Stone” may refer to Robert Hooke’s *Micrographia*, which “tells of experiments in dissolving the stone by means of various liquids” (345). However, its proximity to Woodward’s menstruum suggests a further jab at Woodward’s *State of Physick*.


Gregory Lynall has demonstrated the extent to which innovative studies, such as the Royal Society was doing on magnetism, influenced Gay’s creative output. In his article on Gay’s fable “The Pin and the Needle,” Lynall makes a strong case that Gay regarded natural philosophy as a plausible avenue towards a greater understanding of the moral laws of nature, though he believed scientific spectacles detracted from the knowledge gained through private experimental trials. Lynall’s subsequent book on Swift and Science does even more to unsettle claims that the Scriblerians opposed modern learning. Swift is generally seen as the club member most vehemently opposed to science, because, as scholars claim, he regarded science as inimical to religion, and because he feared that the dreary idiom of natural philosophy was degrading the English language. Rather, Lynall shows, that while Swift was indeed sceptical about the Society’s claims to “true knowledge,” his elusive satires do not condemn science so much as they use its perceived follies as shorthand in debates over cultural authority.

The Scriblerians deserve much of the blame for their continuing reputation as enemies of science, in part because they satirized Woodward as often as they did, and with such evident glee. Woodward was an easy target who could be used to diminish any branch of science by association. Moreover, he had a tremendous capacity to bridge science with any manner of perceived societal decline. His persona was malleable enough to embody all the Scriblerians’ favourite bugbears, including greed, political corruption, and bad writing. More convenient still, Woodward’s enemies had already established him as a nexus of societal ills well before the Scriblerians sank their pens into him. Judith Drake’s 1696 Essay in Defence of the Female Sex (often misattributed to her friend Mary Astell) renders Woodward a principal offender in the crass commercialization of modern learning. As with Memoirs, Drake’s Essay lampoons a metonymic virtuoso figure, whose professional interests far exceed those of Woodward. Yet Woodward is easily recognizable in her descriptions of the egregious scientist who “has abandoned the Acquaintance and Society of Men for that of Insects, Worms, Grubs, Maggots,


Flies, Moths, Locusts, Beetles, Spiders, Grasshoppers, Snails, Lizards, and Tortoises,” and who “shakes the World to Atoms with ease, which melts before him as readily as if it were nothing but a Ball of Salt.”

If we take Hammond’s suggestion and assimilate “Scriblerian” into our critical vocabulary to describe a satirical attitude opposing the commodification of modern learning and writing, then Drake was Scriblerian before there were Scriblerians. Her Essay introduces many of the satirical elements that would characterize Woodward in the coming decades. Beyond merely satirizing his penchant for collecting, she is one of the first to imply that his science is merely a commercial product, and she hints at the fact that he is a scientist by profession, not vocation. She affects an attitude of generosity towards the institution of the Royal Society, especially “Mr. Boyle,” whom she finds “more honourable for his learned Labours, than for his Noble Birth.”

Yet even this nonchalant allusion to his nobility calls attention to the discrepancy between him and the Society’s financially interested rank and file, as does the pecuniary language she uses to decry common virtuosi like Woodward. She criticizes experimentalists and collectors on the grounds that their science of surfaces “will give credit no farther than the visible Stock will extend” (emphasis mine); and, to their hubris, she laments that “so many have so lately been broken by an overstock of that Commodity” (emphasis in the original). However, according to Drake, the imminent threat is not merely the emergence of a professional class of philosophers, but of the close affiliation between these mercenary philosophers and the low, commercial, literature of Grub Street.

Drake expresses great unease with the notion of a competitive print market, which threatened to democratize access to knowledge. Her Essay bemoans the current state of learning wherein a “[great book] of three Shillings may reasonably insult, and despite a six penny Answer, yet the


32 Hammond, 118.

33 Drake, 97.

34 Drake, 97.
Indignity of so low pric’d a Refutation wou’d make a Stoick fret.”35 In a slightly convoluted manner, she thus warns that the lower sorts of people assign as much value to tawdry books as they do to sophisticated ones and that the abundance of cheap philosophy provides the masses with the semblance of learning, while choking legitimate philosophy out of the market. Proponents of ancient learning frequently echoed Drake’s appeal to financial exclusivity. The Grub Street Journal, for instance, indirectly claims that the price of a text does not merely reflect its quality, but actually determines it. In chronicling the decline of learning since the Renaissance, the Journal looks back to a golden era when “printed books, as well as manuscripts, bore a great price.”36 The Journal asserts that high cost books were superior in content because they demanded a high degree of care and study from the top scholars before being republished for sale to the social elites. The Scriblerians were likewise nervous about the close relationship between cheap books and cheap philosophy, and they saw this relationship as portending a decay in traditional social values. As Roger Lund notes, their antagonistic posture towards science and technology expressed broader misgivings about an emerging commodity culture that threatened to erode aristocratic norms.37

Yet another reason that Woodward was such an attractive target, then, is that his professional labour earned him enough money to transcend the circumstances of his birth. As such, he was readily available to embody the triumph of literary and philosophical consumerism over fixed social hierarchies. Royal Society allies recognized the larger implications of Woodward’s rise in status, and attempted to rewrite his personal history. John Ward’s Lives of the Professors of Gresham College (1740) inaccurately claims that Woodward’s “father was a gentleman of a good family in the county of Gloucester.”38 Conversely, most satires of Woodward insinuate that he was an ambitious commoner whose fashionable studies enabled him to step beyond his rightful place. Both narratives are strategic misrepresentations. Woodward was not born a gentleman, but

35 Drake, 98.

36 Grub Street Journal 322 (26 February 1736), 1.


neither was he as lowborn as satires tended to imply. The scant accounts of his birth and early
career indicate that he came from a family of modest means. However, they were
comfortable enough to afford him a classical education at a Derbyshire grammar school where he
excelled in natural history. He did not attend university, but was instead sent to London to
apprentice as a linen-draper. There he met Dr. Barwick, personal physician to Charles II, who
took Woodward into his home, tutored him in medicine, and used his influence to help
Woodward obtain the position of professor of physic at Gresham. It made little difference to
satirists that Woodward actually acquired his fortune through his medical practice, which was a
more reputable profession than natural philosophy since it was not regarded as an experimental
profession. Nor did they care that his scientific monographs, though ponderously written, were
not cheap. For instance, one catalogue advertises Natural History of the Earth at four shillings,
making it even more expensive than Drake’s exemplary philosophical tract. The Scriblerians
appealed to convenient biographical details to depict Woodward as a figure born from the
convergence of hack writing and hack philosophy.

2. **Scriblerus, Fossile, and the Bastards of Modernity**

The Scriblerians and others constructed Woodward as a socially illegitimate product of a
materialistic age, or, to put it coarsely, a bastard of modernity. The metaphor appears to have
been deliberate since illegitimate birth is a prominent theme among many of Woodward’s
effigies, including, as will be discussed, Martinus Scriblerus, and Three Hours’s Dr. Fossile.
When Cornelius Scriblerus boasts at one point that his son is “descended from a Race of
Virtuosi,” for instance, he is, inadvertently, boasting of Martinus’s dubious lineage. The authors
cast doubt upon Martinus’s genealogy from their opening description of the Pergamenian

(accessed September 21, 2016).

Cambridge University Press, 2003):463-484, notes that medicine was not considered an experimental discipline until the
1790’s.

41 A. Bettesworth and C. Hitch, *Books Printed for A. Bettesworth, and C. Hitch, at the Red-Lion in Pater-Noster-Row*
(London, 1734?), 3.
Parchment upon which “was curiously traced the ancient Pedigree of the Scribleri [...] deduced even from the Times of the Elder Pliny to Cornelius Scriblerus” (95). Small linguistic cues diminish our faith in the constancy of Cornelius’s heritage though, including the cagey adverb, “curiously”, and the missing agents who “traced” and “deduced” the pedigree. More diminishing still is the wry assurance that it was “by the singular Virtue of the Women” that his lineage remained certain (95). Questions as to these women’s actual virtue are soon amplified with the Memoirs’ account of Martinus’s grandmother, whose amorous adventures render his true lineage unknowable. Martinus’s mother claimed eminent paternity, though she could not be sure if it were that of German philologist, Gaspar Barthius (Kaspar von Barth, 1587-1658), or the great Scriverius (Dutch scholar, Peter Schrijver, 1576-1660), as her mother was mistress to the former, and one-time “familiar” of the latter (95). Yet this mongrel heritage does not simply express the Scriblerians’ apparent disdain for the modern world. It hints at a much deeper ambivalence regarding both the failures and the triumphs of modern learning.

In their account of Martinus’s obscure ancestry, the authors retell an amusing folk history, which they may have encountered in Pierre Bayle’s Historical and Critical Dictionary (1697, trans. 1709). As the story goes, Schrijved plied von Barth with wine until he passed out drunk, in order that Schrijver might “entertain [von Barth’s] Lady with more liberty.”42 The notion that Martinus’s grandfather was one of these particular men does more than simply occasion an amusing cuckold story. It introduces a contradiction into Martinus’s genetic makeup as to how he is meant to represent the values of modern learning. Both possible grandfathers embodied aspects of ancient and modern learning, though they were not uniformly esteemed. Schrijver was a renowned scholar of classical literature, who continues to earn respect as an antiquary, and whose pioneering historiographic method supplanted mythical, medieval chronicles and greatly contributed to the cultural identity of the emerging Dutch Republic.43 Von Barth, on the other hand, was regarded with suspicion. He was well versed in ancient and modern texts, but where eighteenth-century Europeans deferred to Schrijver as an authority in his field, von Barth, like


Woodward, was reputed for his irascibility and careless scholarship. Bayle reproves von Barth’s habit of “engag[ing] himself in superfluous Refutation,” and Isaac D’Israeli characterizes him as a man “[led] into many errors in that delicate task of animadverting on other authors.”44 Martinus may be a trueborn modern, but who informs the nature of his modernity, Scriverius or Barthius? This question is further complicated, and never resolved, in the Memoirs’ account of Martinus’s extended family, as his mother purports distant relations to the Italian polymath, Gerolamo Caran (1501-1576), Italian naturalist, Ulisse Aldrovandi (1522-1605), and numerous “professors of Physick, Astrology, or Chemistry, in German Universities, from generation to generation” (96). Caran and Aldrovandi were both respectable scientists, and there is no apparent irony in the German professors. Thus, while the Memoirs’ accounts of Martinus’s lineage clearly means to establish him as the product of modern learning in all its absurdity, a close examination actually reveals that his bloodline is an unresolvable tangle of virtues and vices, ancient and modern.

The theme of illegitimacy is even more pronounced in Three Hours after Marriage, a satire similarly aimed at bad philosophy and bad writing.45 These modern follies are embodied respectively in the burlesque scientist, Dr. Fossile (an acknowledged Woodward stand-in), and his niece, the dreadful playwright, Phoebe Clinket. As with Memoirs, Three Hours foregrounds illegitimacy as an analogy for Woodward and his fellow moderns. But, also like Memoirs, the bastard subplot actually complicates the authors’ attitude towards science, and modern culture more generally. Like Gay’s later opus, The Beggar’s Opera (1728), Three Hours deconstructs the weary conventions of its genre. It is structured around a typical cuckold-plot, wherein the aged Fossile is three-hours wed to the profligate Mrs. Townley, who, at the play’s opening, is busy planning trysts with the young gallants Plotwell and Underplot. However, the play delights in subverting generic expectations. Especially pertinent is its debasement of the procreative resolution of a standard comedy, traditionally represented in the double marriage at the conclusion. Three Hours upsets this convention in numerous ways, by denying an obvious hero

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or heroine, by concluding the play with the dissolution of Fossile and Townley’s marriage, and by resolving the main plots at once with the dubiously procreative introduction of a bastard child, who symbolically unites Fossile’s science with Clinket’s writing.

Though abrupt, the child’s introduction is a well-crafted thematic resolution to a play centered on illegitimate philosophical and literary productions. A Deptford sailor arrives in the play’s closing minutes to present the unexpected “Cargo” to Fossile, claiming the doctor had impregnated a “pretty Wench” who stowed aboard the sailor’s ship (52, 54). We quickly learn that the baby boy resulted from Townley’s previous escapades, which she confirms in an aside, crying “Thy Carelessness, Sarsnet, has expos’d me, I am lost and ruin’d” (52). However, her honour is inadvertantly rescued by Clinket, who—arriving late and believing the “child” in question to be her play—confesses it belongs to her and one of her “Drury-Lane Friends” (56). This is a shock to all since Clinket’s singular fixation on her theatrical tragedy seems to preclude romantic adventures, and her bourgeois prudishness had earlier prompted her to denounce “the Libertinism of Lip-Embraces […] on stage” and other indecorous practices of modern culture (15-16). More shocking still, she declares that she “is not in the least mortified with the Accident,” and that she has, in fact, had one “return’d upon [her] Hands every Winter for these Five Years past”; for, as she proclaims, to her uncle’s great horror, “I may, perhaps, be excell’d by others in Judgment and Correctness of Manners, but Fertillity and Readines of Conception, I will yield to nobody” (56). This farcical misunderstanding is the payoff to a brief exchange in the first act, wherein Clinket first articulates the central theme of production-as-reproduction. Unaware of their familiarity, Clinket introduces the actor-producer Plotwell—a likely stand-in for Colley Cibber—to Townley, as “a Gentleman who is so infinitely obliging, as to introduce my Play on the Theatre by fathering the unworthy Issue of my Muse” (14). To which Plotwell responds, “I should be proud, Madam, to be a real Father to any of your Productions” (14).

Clinket’s regard for her writing as offspring echoes the recurring notion of Fossile’s scientific discoveries as his legacy. In particular, he declares his *Museum* of the Curious “a lasting Monument,” immortalizing him as an aggregator of outlandish artifacts like “Hermaphrodites, monstrous Twins, Antediluvian Shells, Bones, and Vegetables” (46, 33). In typical virtuoso fashion, he expresses his desire for procreation as yet another calculated act of scientific
production, revealing that he has chosen Townley from all of woman kind because her “hot and moist” constitution complements his own, which is “cold and dry in the First” (51). He then prescribes her a strict dietary regimen to ensure the maximum intellectual capacity of their offspring.

Fossile’s preoccupation with his antiques and other scientific trifles blinds him to humans and human relationships and renders him an easy dupe for Townley and her suitors. Able only to comprehend the world in terms of rarities, Fossile esteems his new bride as the “best of [his] Curiosities,” and expresses interest interested in the sailor’s “Cargo” only when he believes it might be “some odd Thing” from India. (6, 52). Even upon learning it is a “meer Human Child,” he retains a faint hope that it is “monstrous” in some way, or at least ill. When he is no longer able to deny its normalcy, he vehemently disavows it, which he is, of course, within reason to do as he is not related to the child by blood. However, the bastard’s biological paternity is less significant to the play than its symbolic paternity, which there is ample reason toattribute to Fossile.

The resemblance between Fossile and the child is readily apparent to fellow burlesque natural philosopher, Dr. Possum, who remarks upon a strong “Similitude of Features” (54). He cites the “unequal Circle of the Infant’s Face, [which] somewhat resembles the Inequality of the Circumference of [Fossile’s] Countenance,” and “the Vituline or Calf-like Concavity of the Profile of [Fossile’s] visage” (55). The primary jokes here are at the expense of Fossile’s distorted face (and by extension, Woodward’s) and, more broadly, those natural philosophers who appeal to the already disreputable practice of physiognomy. Yet Possum is not wholly mistaken in recognizing a familial relationship between Fossile and the bastard. Rather, Possum is mistaken when he declares, “The Child is either yours or not yours” (54). In a sense the infant both is and is not the Fossile’s. He is, of course, not Fossile’s biological son, which is impossible considering Fossile’s own admission of sexual impotence, as he had earlier declared “I am no Thunderer” (6). Yet he is the father in a truer sense, both because he eventually claims the child as his own, and because his real-world counterpart, Woodward, is likewise represented in Phoebe Clinket, the apparent mother.
While E. Parker’s six-shilling *Key to Three Hours After Marriage* names Dr. W—d—d as the source for Fossile, and the Countess of W—n—ea as the source for Clinket, these one-to-one correspondences fall apart very quickly. Sholars have long recognized that the character of Clinket far exceeds her similarities with Anne Finch, the Countess of Winchilsea. John Wilson Bowyer notes as many commonalities between Clinket and Susanna Centlivre, but ultimately concludes Clinket “might fit almost any literary lady of the time.” Likewise, Richard Morton and William Peterson, editors of the Lake Erie edition of *Three Hours*, name Margaret Cavendish as a further possible source for the playwright but rather suggest we approach Clinket as a generic “maudlin poetess” or blue-stockings. However, no scholar has thus far looked beyond the superficial category of gender to notice that Clinket and Woodward are two sides of the same antediluvian coin. When the sailor first meets Fossile to deliver the child he identifies the doctor as “the Man that has the Raree-Show of Oyster-shells and Pebble-stones” (52). As Lynall notes, the joke is intended to slight Woodward’s famous collection of fossils, and equate the amusing rarities that were displayed in London fairs with the collections of professional scientists. However, Lynall fails to note that the comment calls back to an earlier quip from the handmaid Prue, who, forced to tote Clinket’s writing-desk on her back, complains, “I had as good carry a Raree-Show about the street” (7). Though the connection has eluded critics, Gay and his co-authors clearly intend to couple Fossile and Clinket, and by extension, Woodward and Clinket. And their similarities continue beyond the shallowness of their respective professions.

When Fossile first mentions Clinket, he describes her as a poor regulator of the domestic economy, complaining that “instead of Puddings, she makes Pastorals” (7). The obvious implication is that her obsession with writing has rendered her unsuitable for conventional domestic labour, but the complaint also recalls the above-mentioned condemnation of Woodward’s “hasty pudding” theory. This comparison is reinforced by the fact that Clinket toils on a second-rate tragedy based on the same topic that first earned Woodward notoriety, “The


47 Morton and Peterson, *Three Hours*, ii.

“Universal Deluge” (18). Indeed, references to Woodward’s theory of the Flood abound throughout *Three Hours*, including Fossile’s obsession with artifacts from that event, his search for a universal menstruum, and Clinket’s enthusiasm for the Deluge as a “Subject untouch’d either by Ancients or Moderns” (19).

Moreover, with a dramatist’s instinct, Clinket repeatedly gestures towards the notion that she and her uncle are complementary theatrical types. When she has an inkling that Fossile’s marriage has cast him in the role of a “Dramatick Character,” for instance, she offers her skills to resolve the situation. “I have always used you as my Physician,” she says, so “why should not you use me as your Poet?” (30). She makes the comparison more explicit in a later scene when she declares, “We are both of us the Votaries of our great Master Apollo,” and asks “Why then should we jangle in our Kindred Faculties?” (49). Gay and the others weave so many connections between Clinket and Fossile, Clinket and Woodward, and, of course, Fossile and Woodward, that it is hardly possible to deny their intended unity. It is fitting then that the plotlines of both Woodward figures converge in the same burlesque act of reproduction, when Fossile adopts the bastard into their home. In the end, their illegitimate offspring satiates Fossile’s desire for posterity and Clinket’s undiscerning muse. In yet another moment of metatextual acuity, Clinket acknowledges the thematic unity of the resolution. As she declares in her final line, “You [have got] a fine Child; and I a Plot for a Comedy” (58).

As with *Memoirs*, however, the bastard progeny in *Three Hours* presents a conundrum, the irresolvability of which is apparent in the vastly different ways scholars have interpreted the ending. John Fuller, who approaches the *Three Hours* as a well-wrought but essentially trivial farce, regards the child’s presence as yet another manifestation of the play’s “insane but inevitable logic.”

Morton and Peterson assign something of a moral by implying Fossile and Clinket receive their just desert when they “are left at the end of the play with a child of dubious parentage on their hands.” Conversely, Katherine Mannheimer regards the “troublesome child” as “a crystallization of transgression and (literally) bastardization,” but concludes this hybrid

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50 Morton and Peterson, xvi.
production of Fossile’s recondite, “book-bound”, philosophy, and Clinket’s embodied and insistent dramat biblical presence, enjoys the ultimate “triumph”.51 “Triumph”, however, is a strong word for such an ambiguous ending. The play resolves on a vaguely optimistic note, but one in which all social ideals are severely compromised. Clinket renounces her bathetic tragedies, but rather than pursuing a more proper occupation, she redirects her energies to a different genre of scribbling. Townley returns to her estranged, but still lawful husband, Lieutenant Bengall; though the epilogue makes a joke of his forgiveness, when Mrs. Oldfield (who plays Townley) states in the epilogue that “None but a Tar could be so tender-hearted,/ To claim a Wife that had been three Years parted” (60). And, while Fossile restores social harmony by taking in the child, he does so with the resigned admission that “caressing a Child that is not [one’s] own” is a reasonable act, insofar as “a Thousand Husbands are doing the same Thing this very instant” (58). If Gay and the others offer any lesson at all, then, it is that the most appropriate response to a degraded culture such as theirs is laughter.

The Scriblerians’ recourse to laughter in the face of societal transformation need not imply the sharp critique that scholars so often presume. In an article on monstrous women in eighteenth-century satire Susan Gubar cites Clinket’s “misshapen offspring” (meaning her plays) as emblematic of what the Scriblerians perceived as “the corruption of literary and ethical standards in Walpole’s England.”52 Gubar’s broad-brush analysis edges on hyperbole when she claims the Scriblerians projected anxieties about their own hybrid literature onto monstrous females like Clinket, who, Gubar claims, functions as “a dark parody” of the authors themselves.53 Yet this assertion does, albeit indirectly, touch upon the play’s awareness of itself as a hybrid of ancient and modern forms. Rather than expressing unease with their own bastard production, however, the authors embrace the play’s hybridity. Three Hours borrows openly from all genres of contemporary theatre. It appropriates basic scientific tropes from Shadwell’s comedy The Virtuoso (1676); it models Fossile and Clinket’s dynamic on Aphra Behn’s farce, The Emperor of


53 Gubar, 389.
the Moon (1687), which likewise features a virtuoso doctor and his poetical niece; and it derives a crucial plot element—Fossile’s supposed Touchstone of Virginity, with which he tests his bride’s fidelity—from Thomas Middleton and William Rowley’s tragedy, The Changeling (1622, pub. 1653). Three Hours is an unapologetic pastiche, for which its Key names a dozen modern sources. At the same time, the play foregrounds the tension within it, between modern genres and those of antiquity. In her closing address to the audience, Mrs. Oldfield acknowledges the play’s hybridity, noting that “The ancient Epilogue, as Criticks write,/ Was, clap your Hands, excuse us, and good-night”; whereas, the modern epilogue is “a kind Essay/ To reconcile the Audience to the Play” (59-60). The playwrights obviously count Three Hours in the latter category as Mrs. Oldfield directly proceeds to reconciling the audience. Thus the play appears less an edgy reaction to the literary corruption of Walpole’s England, as scholars have traditionally supposed, than a light-hearted exploration of the cultural transformations of its day.

3. Woodward’s Metamorphoses

Cultural transformation is a regular theme in Scriblerian treatments of Woodward. The instability he represents is apparent through numerous allusions to Ovid’s Metamorphoses, a narrative preoccupied with the fluidity of individuals and society. Three Hours draws heavily upon Ovidian themes to implicate science in England’s cultural transformations, as do the minor publications, Annus Mirabilis (1722), and “An Epistle to the most Learned Doctor W--d----d” (1723). All three texts feature Woodward, or a Woodward figure, in a manner that initially appears to condemn modern science and society, but ultimately presents a more ambivalent attitude. As scholars have noted, the Scriblerians, particularly Swift and Pope, regularly invoke Ovid to satirize their culture’s degraded values. Peter Schakel cites Ovid as a key influence in Swift’s poems about dissembling women, notably “Cadenus and Vanessa” (1713), and “A Beautiful Young Nymph Going to Bed” (1731? pub. 1734). And David Womersley notes several passing allusions in Gulliver’s Travels. For instance, Gulliver praises the Houyhnhnm

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for “know[ing] not the Use of Iron” (412), implying they have not declined from their golden age into, what Ovid describes as, “that hard age/ Of baser vein.”56 Similarly, Ralph Cohen regards the transformation of Belinda’s bodkin in The Rape of the Lock as Pope’s commentary on the declining values of his society.57 For similar reasons, Robert Folkenflik declares it “Pope’s most Ovidian Poem.”58 Ulrich Broich further explores Ovidian imagery in The Rape of the Lock, claiming such allusions reveal the Characters’ base desires, as when Belinda’s maids “are turned into bottles and ‘call aloud for Corks.’”59 Yet such scholarship typically assumes that Swift, Pope, and the others, depict transformation as inherently negative. But, ironically, the same process by which the Scriblerians metamorphosized Woodward into a living antithesis of classical values opened up space for optimism about other facets of modernity.

Intertextual connections between Three Hours and the Metamorphoses are well documented, but there is a broader, and yet unexplored, relationship between Ovid’s long poem, and Scriblerian treatments of Woodward in Three Hours and elsewhere.60 The most memorable references in the play occur in Fossile’s museum of curiosities, wherein Plotwell and Underplot literally transform themselves into monsters. Disguised as Fossile’s most valuable Egyptian artifacts, the rakes—initially unaware of the other’s presence—assume Ovidian personae in their attempts to seduce Townley. With some inkling that suitors have infiltrated his manor, Fossile jealously locks his wife in his antiquary chamber, but the moment he leaves her alone, Plotwell ambles forth wrapped up as a mummy, attempting to grasp her, as “Jove within the Milk-white Swan compress’d his Leda” (43). Suddenly conscious of his romantic competition, Underplot rushes forward in the skin of a crocodile, tears her from his rival, and embraces her as “Jove within the

56 Ovid, I, 127. See also, Womersley, Gulliver’s Travels, 412-413n.


60 For a brief but comprehensive account of the play’s references to Metamorphosis, see Morton and Peterson, x-xv.
Serpent’s scaly Folds, Twin’d round the Macedonian Queen” (43). Beyond explicitly aligning the transformations in Three Hours and the Metamorphoses, these carefully chosen references to Leda and Cleopatra implicate the science of Fossile/Woodward within the same manner of ambitious dissembling that eventually caused the fall of the Trojan and Ptolemaic empires. Moments such as these hint at the destabilizing potential of Fossile’s own ambitious dissembling, the metamorphosis from commoner to gentleman, made possible through his scientific profession.

Like Woodward, Fossile wears the form of a gentleman physician, but he is neither of those things. He is, rather, a quack doctor who doles out bizarre prescriptions to his rustic patients (10-12). And, he is a false gentleman who purchases the esteem of his scientific peers in the form of curiosities. He depletes his coffers by paying vast amounts to a Jewish merchant in exchange for worthless artifacts, such as a fifteen-guinea vial of dust, supposed to be the remnants of the “the flying Dragon so celebrated by Antiquity” (42). Thus, his motive for marrying Townley, beyond siring his own curiosity, is to gain access to “Her Jewels, her Strong Box, and all her Things,” along with an anticipated inheritance, which would allow him to continue squandering his wealth on burlesque status symbols (8). While the source of Fossile’s original fortune is unknown, the playwrights make it clear he was not to the manner born. They gesture towards his low origins through his incompetence with classical languages, which should be first nature to a true gentleman. Disguised as a Polish virtuoso, Plotwell flaunts his breeding, as he beckons the doctor, “Illustrissime Domine, huc adveni,” or, “Illustrious Lord, come hither” (31). Fossile clumsily replies, “Illustrissime Domine—non usus sum loquere Latinam” (31). He intends, “Illustrious Lord, I am not used to speaking Latin,” but mistranslates the quasi-modal, “used to,” and produces a pair of unrelated fragments: the perplexing claim, “I am not used,” along with the infinitive phrase, “to speak Latin.” This small grammatical slip is extremely revealing of his character, and would not be missed by audiences. Fossile’s attempt to translate verbatim

61 For a fuller discussion of crocodile iconography as it related to science, see chapter 4 of this dissertation.


63 I am grateful to Brendan Cook, from the University of South Florida, for his detailed translation of the passage.
announces that, beneath his genteel pretensions, he still thinks in the language of a commoner. By staging Fossile’s imperfect metamorphosis into a gentleman, the Scriblerians were at the same time furthering their ongoing project of metamorphosizing Woodward into an embodiment of burlesque natural philosophy.

Fossile’s paucity of learning is an obvious indictment of Woodward’s faux gentility, despite the fact that Woodward was competent enough in Latin to have written Naturalis Historia Telluris (1714) in response to a colleague’s criticism of Natural History of the Earth. Neither did the Scriblerians care that Woodward disdained the Egyptian artifacts with which he was so closely associated. They were reluctant to spoil a good joke for the mere sake of accuracy, and thus nearly all of their references to Woodward included jabs at his supposed obsession with ancient Egypt. Sometimes these are subtle, as in Gulliver’s Travels, when Gulliver tries to impress his Houyhnhnm master with his own medicinal purgative, which consists of “Herbs, Minerals, Gums, Oyls, Salts, Juices, Sea-weed, Excrements, Bark of Trees, Serpents, Toads, Frogs, Spiders, dead Mens Flesh and Bones, Birds, Beasts and Fishes” (379). As has been noted, the individual elements in the recipe recall the sciences with which Woodward was most closely associated, geology, natural history, and digestion. Likewise, the dead men’s flesh is recognizable in terms of Woodward’s supposed preoccupation with mummies. Pope draws a more explicit connection in The Dunciad when he refers to Woodward as “Mummius, Fool-renown’d,/ Who like his Cheops stinks above the ground.”

Such references soon came to characterize Woodward in the public imagination, despite his contempt for Egyptian culture and science. His book On the Wisdom of the Ancient Egyptians (1777)—which had been circulating in manuscript since the early eighteenth century—scorns the Egyptian pantheon that captivated and delighted so many Britons, as “wild, rambling, and

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without any good design.” And he further derides the ancient science of mummification with which he was so closely associated. Having once examined a body transplanted from Egypt he concluded mummification to be “a very sorry manner” of preservation, recounting how the corpse soon “began to corrupt and grow mouldy, emitted a foeted and cadaverous scent, and in conclusion, putrified and fell to pieces” (27). The Scriblerians did not, however, concoct Woodward’s false associations with Egypt at random. As the next chapter of this dissertation discusses, the Royal Society attempted to legitimize modern science by drawing an imaginary line back through the lost sciences of Egypt and Babylon. Thus, ready-made associations made it a simple matter to metamorphosize Woodward into a Mummius figure, a living artifact, whose obsession with dusty trinkets diverted him from the higher values of a classical humanist.

3.1. Woodward and the Years of Miracle

Perhaps inadvertently, such literary metamorphoses of Woodward opened up room for optimism about science and other aspects of the modern world. As Woodward was transfigured into that which was debased about modernity, he simultaneously became available to contrast that which was hopeful. This phenomenon is apparent in the two most self-consciously Ovidian burlesques of Woodward, *Annus Mirabilis*, and the subsequent “Epistle to the most Learned Doctor W—d----d.” These satires, which centre on a “Miraculous” transformation of a global scale, at once disavow the perversions of modern learning, and embrace its material benefits. The short comical essay, *Annus Mirabilis*, which first circulated under the pseudonym Abraham Gunter, predicts an imminent planetary conjunction—foretold by the ancient Egyptians and confirmed by modern philosophers—that envisions “the mutual Transformation of the Sexes […] the human Males being to be turned into Females, and the human Females into Males” (73). While the

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68 “Abraham Gunter”, *Annus Mirabilis; or the Wonderful Effects of the Approaching Conjunction of the Planets Jupiter, Mars, and Saturn* (London, 1722); John Gay, “An Epistle to the most Learned Doctor W—d----d; From a Prude that Was Unfortunately Metamorphos’d on Saturday December 29, 1722,” *The Poetical Works of John Gay*, ed. G.C. Faber (London: Oxford University Press, 1926), 639-642. The “Epistle” was probably a collaborative piece, which is why Vinton Dearing omits it from his edition of Gay’s *Poetry and Prose*, and why Faber includes it among Gay’s “Doubtful Pieces.” Faber suggests “that Arbuthnot rather than Gay was the author of this epistle” (xxxii). However, Kerby-Miller finds the “versification […] too facile and rollicking for Arbuthnot alone,” *Memoires* (48n).
precise authorship is unknown, Yvonne Noble concludes that it was almost certainly written by Pope and Swift, with input from Arbuthnot and Gay. This attribution is bolstered by the essay’s inclusion in the Pope-Swift Miscellanies of 1732, this time under the familiar pseudonym, “Mart. Scriblerus.” Annus Mirabilis was apparently written to drum up interest in a revival of the opera Crispo, and perhaps to taunt the castrato, Senesino. However, its authors take the occasion to ridicule the usual Scriblerian targets of false learning and cultural corruption.

On first pass, Annus Mirabilis does not seem especially political, though it includes some broad political commentary and religious baiting, as when it predicts, that “There will be no preventing Disorders amongst the Friars and Monks; for certainly Vows of Chasitity don’t bind but under the Sex in which they were made” (77). Instead it presents itself as a somewhat tawdry exploration of the present habits of the sexes. Thus, Noble reads it as a cathartic reaction to grim period in the lives of the Scriblerians, with Gay suffering heavy financial losses from the burst South Sea Bubble, Pope, and to a lesser extent, Arbuthnot, apprehensive about the increased persecution of Catholics, and Swift feeling himself something of a political exile in his Deanery at St. Patrick’s Cathedral in Ireland. Though more speculative than evidentiary, Noble’s theory goes some way to explaining why Annus Mirabilis feels slightly darker than typical Scriblerian fare. At one point, it jokes about whether the impending transformation should not “discharge all Suits of Rapes”; at another, it ponders the sexual consequences of the “false Prophet Mahomet” when the “many fine Women” of his harem transform into “many fine young Gentlemen at his Devotion” (78). However, it is typically Scriblerian in the manner with which it embeds a sophisticated exploration of commercial society within a series of crude puns and innuendos, and, especially, in the way it implicates modern science in the prospect of a culture turned upside down.

Though the transformation is given as an ancient prediction, the Scriblerians bring it under the purview of modern science. In both versions, the “author”, be he Gunter or Scriblerus, adopts the moniker “Philomath”, and describes himself as a “Well-Wisher to the Mathematics” (73). His

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70 Noble, 22-26.
obsession with Egyptian prophecy recalls Woodward and other Royal Society antiquaries. And he extols the virtues of modern philosophy, though inadvertently making a dirty pun of science, when he boasts the transformation will come as no surprise to philosophers “who search into the Bottom of Things” (75). This seemingly innocuous quip is the first salvo in a multipronged attack on modern philosophy and modern culture. The sexualization of science is a running theme in *Annus Mirabilis* and the “Epistle”, and both score easy laughs implying science is a perverse mode of investigation. Yet beneath these jokes is a deceptively layered satire of science and society in which unnatural sexuality serves as a vehicle to comment upon commerce and the disintegration of fixed hierarchies. *Annus Mirabilis* alternately charges science with being a commercial enterprise of little consequence and a total affront to cultural stability.

The authors assume a dismissive posture towards science when they include in the advertisements at back, “Planetary Powders, as necessary for the new Births of Sexes, as Sperma Ceti for the *Puerperous* Women” (82). Beyond diminishing science through bawdy associations, the authors reduce its productions to the sorts of trinkets for sale at *Mr. Deard’s Toy-Shop*, advertised just below (82). At the same time, however, *Annus Mirabilis* foretells a global upheaval, in which basic societal structures are overturned. Projectors are shown to have a personal interest in this perverse new culture, as Philomath enthusiastically predicts a reversal of social classes and institutions. Alongside bodily metamorphoses, the essay foretells a fundamental transformation of “the Ideas and Inclinations of the two sexes” (74). Ladies will not merely become gentlemen, but coquettes will become ministers, bawds will become plenipotentiaries, and chambermaids will become cabinet-counsellors to the princes of the earth (79). Even those at the lowest social strata will rise through the professions as spinsters are transformed into magistrates and oyster wives are called to the bar (80). While the associations between sex, science, and social disruption seem improbable, *Annus Mirabilis* was framed by an increasingly urgent cultural discourse regarding sexual reproduction, and the reproduction of power, a theme the coterie would revisit in the subsequent “Epistle”.

The “Epistle” similarly implicates the burlesque science of Woodward and his kind in the grotesque transformations many perceived in modern society. The “Epistle” is written as a plea to Woodward, from an unfortunate virgin-prude, aptly named Prudentia. Having read, but
dismissed, the warnings of *Annus Mirabilis*, Prudentia is embarrassed, on the ill-fated opera night, by the agitation of “airy particles” in her bowels, which grow into “restless torrents” (41, 45). However, her discomfort gives way to horror when from her “gaping hideous Chasm […] Some Mountain she thrusts forth” (62-63). Aghast at the monstrous phallus that now “bears aloft [her] Hoop,” she turns to the man most closely associated with monstrous transformations, and (oblivious to her own dirty pun) implores Woodward to “attend [her] Tale” (19). The poem exemplifies a small but significant genre of visual and literary texts, inverting, and politicizing, the sexual and reproductive body. Lisa Forman Cody details this phenomenon in her book, *Birthing the Nation*. As she notes, both *Annus Mirabilis* and the “Epistle” appear among a cluster of seventeenth- and eighteenth-century texts that reverse male and female roles in biological reproduction. Both works make a joke of the emerging, scientific, manner of envisioning reproduction, thereby satirizing the naturalists, physicians, and male-midwives, who sought to locate the patriarchal authority once located in the body of the monarch within their new paradigms of knowledge. However, Forman Cody says little about the “Epistle” beyond this social context. Unlike *Annus Mirabilis*, which, she claims, “announced that in the 1720s [the authors] lived in a monstrous world with an illegitimate German king and a vapid philosophical spirit,” the “Epistle” appears merely as “an attack on Woodward’s sexual person.” But while the poem is less explicitly concerned with societal transformation than its precursor, it is far more political than Forman Cody asserts. The poem’s central themes of transformation and unnatural birth bring it in line with earlier cultural satires like *Memoirs* and *Three Hours*. Moreover, the choice to address the epistle to Woodward situates it within the kinds of cultural discourses that preoccupied the Scriblerians.

Reproduction was not among Woodward’s professional interests, but his infamy lent gravity to metaphors about the birth of an unnatural world. Years earlier, the anonymous author of *Tauronomachia* drew the same connection in claiming that “[Woodward] tells how all things had

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72 See Forman Cody, 84-119.

73 Forman Cody, 117.
their birth./ As if Man-Midwife to the earth” (1). The “Epistle” continues in this tradition, describing Prudentia’s metamorphosis through mixed images of geology and midwifery:

Thus when an Earthquake shakes the trembling Ground,

First, from below, strange bellowing Noises sound;

Inward Convulsions torture Mother Earth,

She seems prepar’d to give some Monster Birth. (1)

As with other Woodwardian satires, the crass sexual metaphor of the “Epistle” gestures towards England’s transformation into a crass, commercial, society. Pope would make a similar allusion in his fourth satire of Donne (pub. 1733). Criticizing Walpole’s government, and the commodification of everyday life, he complains that as “turnpikes rise, and now no cit nor clown/ Can gratis see the country or the town.” 74 Then, in a vulgar blend of purgation and rape imagery, he compares Woodward’s physic to the vomitous production of modern society, writing, “As one of Woodward’s Patients, sick and sore,/ I puke, I nauseate,—yet he thrusts in more.”75 The “Epistle” likewise slanders Woodward’s medical practices when Prudentia implores, “Your Patients Lives for some few Moments save,/ And let my Griefs reprieve ‘em from the Grave” (3-4). Though subtle, Prudentia’s appeal does essentially the same work as Pope’s satire of Donne in bundling Woodward’s harmful medicine—itself a metaphor for the worst aspects of modern science—together with the cataclysmic birth of modern society. Neither Annus Mirabilis nor the “Epistle” fully articulates these unlikely associations, but this strategy of withholding provides the double advantage of forcing readers to connect the dots for themselves, and rendering it impossible to rebut accusations that have only been implied. Yet the larger cultural context is clear enough, especially when read against John Dryden’s original Annus Mirabilis (1667), a somewhat insistent paean to England’s military and commercial triumphs of 1666.76

However, the limited intertextuality between these three works further complicates the Scriblerian satires, which oscillate in their attitudes towards modernity. Scholars generally read the later *Annus Mirabilis* and its sequel as subverting the hopefulness of Dryden’s poem, which had itself reframed a violent year, and the year in which London burned, into a “Year of Miracles.” According to Noble, this re-reversal conveys the “satirists’ anxiety, and profound sense of powerlessness at a time of danger.” Forman Cody similarly claims the Ovidian burlesques were written at “Dryden’s expense.” And certainly there are moments in the Scriblerian works that poke fun at the original. When Prudentia recounts the events leading up to her metamorphosis, for example, she acknowledges that “*Anna Mirabilis*—this change foretold,” but she had dismissed it as the work of hack science and hack writing (26). This is an obvious reference to the Scriblerian *Annus Mirabilis*, but the “Epistle” does not differentiate the obscure Scriblerian pamphlet from Dryden’s celebrated poem, and thus quietly deflates the optimism of the original. The authors could assume a large portion of readers would mistake the original *Annus Mirabilis* for that which Prudentia dismisses as “*Grubstreet* all o’er—the Paper—Stile—and Print” (28). And even those familiar with the Scriblerian *Annus Mirabilis* would be impelled to consider the link between Dryden’s triumphant poem and the Scriblerian burlesques. However, the relationship between Dryden’s poem and the Scriblerian replies is somewhat more subtle than mere contradiction.

There are remarkably few direct references within the Scriblerian satires to Dryden’s vision of an empire rising from the ashes of London’s great fire. Yet all three are united by themes of modernity and science. In Dryden’s poem, science represents the triumph of English society and its imperial opportunities. Its “Digression Concerning shipping and Navigating,” for instance, turns from a description of England’s military victories over the Dutch to boasts of England’s merchant navy. The poem envisions trade routes that will soon traverse the planet, and perhaps beyond, thanks to the advanced navigation provided by Gresham College astronomers, declaring, “we upon our Globes last verge shall go,/ And view the Ocean leaning on the sky: From thence our rolling Neighbours we shall know,/ And on the Lunar World securely pry” (170-171:

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77 Noble, 28.

78 Forman Cody, 116.
654-657). These are the same stargazers to whom Prudentia pays the equivocal compliment, “these Astrologers ar’n’t always blind” (24). Science becomes even more central to England’s miraculous rebirth as Dryden celebrates the “chymic flame” for clearing away the “rude and low” city that had once sat on the Thames (199: 1169, 200: 1183). He then exalts the “Arts of Modern Pride” with which the Royal Society was associated (200: 1184). Once briefly a Fellow, Dryden praises the Society in a long apostrophe wherein he assures his reader that God will grace England in the future, thanks in large part to those men of science “Who great in search of God and Nature grow:/ Who best your wise Creator’s praise declare,/ Since best to praise his works is best to know” (171: 658-660).

The centrality of science in Dryden’s ode to transformation offers a plausible explanation for the Scriblerians’ ambiguous references to his poem. However, Annus Mirabilis remains a perplexing vehicle through which to satirize Woodward and England’s cultural metamorphosis. Despite assertions to the contrary, the Scriblerian Annus Mirabilis and the “Epistle” do not substantially undermine the optimism of the original. Indeed the Scriblerians’ choice of Dryden’s tribute to English prosperity highlights their own ambivalences about England’s material gains, which were facilitated directly and indirectly by technological innovations. Scholars are growing increasingly sensitive to these ambivalences. Analyzing the imperial commodities on Belinda’s dressing table in Rape of the Lock, for instance, Alex Hernandez makes the crucial point that Pope is not condemning the materiality of modern life, but rather meditating upon it.79 Similarly, Laura Brown reads the poem as an extended “statement that recognizes the destructive cultural effects of commodification while maintaining allegiance to the imperialist ideology which produces those effects.”80 The same dissonance is present throughout Scriblerian references to imperial commerce.


Scholars once regarded the crooked traders and plantation owners of the West Indies in Gay’s ballad opera *Polly* (1729) as straightforward criticisms of England’s South Sea colonies.\(^{81}\) However, such readings are increasingly seen to overstate Gay’s opposition to English imperialism, and to have more or less ignored his own financial interests in colonial exploitation. *Polly* levels its satire at the vices of particular colonial administrators but nowhere condemns the colonial project. Indeed, as Jochen Petzold observes, the play concludes with the native king, Pohetohee, defeating the encroaching pirates, thereby re-establishing traditional colonial relations with England.\(^{82}\) Swift’s corpus is similarly conflicted. He frequently assumes a disdainful attitude towards England’s material excesses, as when his buffoonish mariner, Gulliver, brags that “this whole globe of earth must be at least three times gone round before one of our better female yahoos could get her breakfast or a cup to put it in” (374). Ironic moments like this have often been regarded as a “denunciation of English colonialism”.\(^{83}\) Yet Swift expresses a favourable opinion of imperialism in his “Ode to the Athenian Society” (1692)—a faux scientific body he did not yet realize was a literary sham. Comparing England’s growing empire to that of Rome, he declares that traces of the Athenian Society’s science shall forever remain, “Like a just map, to tell the vast extent/ of conquest in your short and happy reign.”\(^{84}\) This sentiment did not change in later life. David Oakleaf notes that Swift’s sensitivity the plight of the colonized Irish “seems not to have interfered with his willingness to see Englishmen like himself profit from the slave trade.”\(^{85}\)

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Perhaps Pope’s “Epistle to Mr. Addison Occasioned by His Dialogues on Medals” (1720) best summarizes the ambivalence towards science and empire that he and his friends shared. Again, likening England to Imperial Rome, he muses on the fate of an empire, whose “triumphs [are now] shrunk into a coin” (24). Modern antiquaries, he complains, take no lesson on how to emulate Rome’s past glory, because they cannot appreciate anything beyond its timeworn relics. Recalling Woodwardian effigy, Cornelius Scriblerus, Pope chastises those antiquaries who dismiss the human beauties depicted on their relics, and only “the rust adore” (35). Yet the poem later praises the antiquary Dialogues, likening Addison to a modern Virgil (62). Moreover, the “Epistle to Mr. Addison” concludes on a note of optimism regarding the larger scientific endeavour, projecting a future “when shall Britain, conscious of her claim,/ Stand emulous of Greek and Roman fame” (54-53); and when ancient learning merges with modern, when “Plato’s, Bacon’s, [and] Newton’s looks agree” (60). In this way, it is tempting to read the “Epistle to Mr. Addison” as a celebration of England’s rise as a technological-imperial power. Unlike Dryden’s Annus Mirabilis, however, Pope’s is a subdued optimism. The great minds of England may indeed raise the nation to Roman fame, but what kind of fame is that to be? He poses this question from the opening lines when he describes Rome as “a sad sepulchre” (2), whose now tarnished wonders were “raised on nations spoiled./ Where mix’d with slaves the groaning martyr toil’d” (5). These problems of slavery, plunder, and impermanence remain unresolved, leaving the reader to determine whether England’s rise is actually a triumph, and to what extent we should be optimistic about modernity. This indeterminate attitude towards science carries forth into the Scriblerian Annus Mirabilis, which critiques England’s transformation into a modern empire, but closes with a vision of familial and national tranquility, assuring us that “the Ladies may govern the Affairs of the World, and the Gentlemen those of their Household, better than either of them have hither done” (81). As with the “Epistle to Mr. Addison,” then, Annus Mirabilis presents modernity as a fait accompli over which the reader might reasonably rejoice or despair.

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As for Woodward, he did eventually achieve a small measure of redemption from an influential man of letters, though he was not alive to enjoy it. In the second volume of the *Lives of the Most Eminent English Poets* (1779), Samuel Johnson disparages *Three Hours after Marriage*, complaining that Gay and his co-authors intended the play “to bring into contempt Dr. Woodward, the Fossilist, a man not really or justly contemptible. It had the fate which such outrages deserve.” However, Johnson’s brief account makes two important errors. While *Three Hours* did not achieve anything approaching the success of *The Beggar’s Opera*, it was by no means a flop, earning seven consecutive performances in its opening run. More importantly, Johnson mistakenly reads the play as a vicious attack on Woodward’s person. Although the Scriblerians expressed disdain for Woodward throughout their works, their satires of him, even those that disparaged him by name, always exceeded the man. In his literary treatments, he was more of an idea than a person. A real life burlesque natural philosopher, Woodward was the failure of modernity personified. However, this superfluousness of character made it impossible for Scriblerians, or other satirists, to attack him on consistent bases or with consistent agendas. Woodward was useful to satirists as a rhetorical short-hand, but he could not adequately contain the deeply conflicted attitudes towards science and modernity held by his detractors and the culture at large.


Chapter 3
Burlesque Natural Philosophers: Henry Fielding and Popular Science

What does it mean that eighteenth-century Britons were so eager to laugh at the peculiar, and occasionally grotesque, practices of early science? Prevailing images of the buffoonish experimenter seem to suggest the majority opinion was against the Royal Society and their kind. As previous chapters have discussed, this has certainly been the default position of modern scholarship. Few major studies have entertained the possibility that the proliferation of comic texts that are apparently hostile to the new sciences is in fact evidence of a society attentive to the theories and practices being lampooned. Indeed, it is hardly possible for these many sendups to have resonated with a broad reading public were that public not already, at least somewhat, familiar with the source material. Acknowledging this engagement becomes even more important to our understanding of scientific burlesques as they become subtler and more sophisticated than the standard Gimcrackean satires of the late seventeenth and early eighteenth centuries. Henry Fielding’s scientific parodies (nearly always misclassified as corrective satires) and related comic episodes offer crucial insights into the status of natural philosophy around the middle of the century, a point when science had undeniably entrenched itself in the culture at large. Fielding has long been regarded as a paradigmatic humanist of the late Augustan age, and thus, it has been easy to explain his treatment of science in opposition to a crude, materialistic, worldview. In reality, Fielding was sensitive to both the major scientific discourses of his day and to his audience’s familiarity with these discourses. Thus, examining Fielding’s apparently anti-scientific writings—indeed of lingering anachronisms including “Augustan” and “humanist”—offers insights into the high status of science in mainstream culture of the mid-eighteenth century, and further insights into the complex manner in which scientific discourse was interwoven into larger moral, cultural, and theological conversations.
In his tercentenary retrospective, Robert D. Hume characterizes Fielding’s writing as, among other things, “experimental” and “circumstantial.”¹ By this he means Fielding constantly innovated literary forms, to best represent “the events, issues, politics, quarrels, social problems, and stresses of his place and time.”² This is certainly the case in his explorations of science, both its practices and general ethos. As we shall see, he adapted his formal and narrative styles to reflect emerging modes of curating and evaluating knowledge, alternately assuming the role of scientist in ephemeral parodies, or casting the reader as scientist in his longer novels. Yet Hume continues, somewhat less generously, to assert that Fielding’s literary experiments were “circumstantial”, which is to say, he produced them “as a hackney writer out to make a quid.”³ This account of Fielding as a mercenary writer is apparently consistent with Fielding’s own account of his career, at least according to his cousin, Lady Mary Wortley Montagu, who recalls him admitting to “having no choice […] but to be a Hackney Writer or a Hackney Coachman.”⁴ It is certainly possible that Fielding intended the claim as genuinely self-deprecating, though his penchant for irony leaves ample room for doubt. As Thomas Lockwood argues in his under-cited article, “The Augustan Author-Audience Relationship,” however, we need not regard “hack” as a diminishing term.⁵ Though this article hits several stumbling blocks of its time—Augustan values, Tory-Whig binaries, and the like—it makes the remarkable claim that a mid-century “hack” writer can be understood as one who “comes increasingly to identify with the audience on the basis of social likeness.”⁶ According to Lockwood, Fielding was not a satirist like Pope and Swift, who addressed themselves to “an exclusive minority, an audience whose merit mainly


² Hume, 259.

³ Hume, 259.


⁶ Lockwood, 649.
consists in the very fact that they are unrepresentative of a vulgarized world.”

Rather, he was a comic writer whose attitudes generally represented those of his audience. This is not to suggest that Fielding assumed a morally neutral stance. To the contrary, he proudly declares himself “sanguine enough to aim at serving the noble Interests of Religion, Virtue, and good Sense.”

Unlike satirists of previous generations, however, his interests and values, or at least those expressed in his writing, were not intended to preach, but rather reflect, those of his readership.

On first glance, Fielding appears resolutely opposed to experimental science. Ventriloquizing a character in his sister’s *Familiar Letters* (1747), he decries the scientists of his day as “the first great Corrupters of Taste,” whose “Endeavours are not to discover the Beauties, but the Oddities and Frolicks of Nature.”

An article in the *Covent Garden Journal* similarly chastises natural philosophy as a distraction for the bored rich when it asks “What but the utmost Impatience of Idleness, could prompt Men to employ great Pains and Trouble, and Expence too, in making large Collections of Butterflies, Pebbles, and such other wonderful Productions?”

Fielding’s mockery extends beyond backyard naturalists, and makes the nation’s highest scientific authority a regular target, as when *The Champion* declares that an illiterate man is “barely qualified to be a Member of the R[oyal] S[ociety].”

Fleeting asides like these permeate Fielding’s writing, and appear indiscriminately reproachful of empiricists who clumsily pursue evidence of nature’s deficiencies, rather than God’s perfection. In his more involved treatments of science, however, including three Royal Society parodies and a number of key moments in *Tom Jones* (1749), a

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7 Lockwood, 649.


rather more complex image begins to appear. Such instances display a sophisticated appreciation for all types of empirical study, and are as apt to be affectionate as corrective.

Fielding’s supposed scorn for science is frequently noted but little examined. The standard scholarly position is that the century’s many satires against science registered a broad conservative resistance against empirical epistemology, which was seen to “threaten the social order.” Histories of the novel uphold Fielding as a prominent figure of such resistance. Ian Watt, asserts that Fielding’s neoclassical aesthetics, which traded in universal types and truths, contrasted empirically-minded authors who sought to portray the world “in all its concrete particularity.” Michael McKeon further claims that Fielding critiques the “naïve empiricism” of the Royal Society “and its modernized methods of imposing on the credulity of the reader.” With so many contemptuous asides scattered throughout his writing, it is understandable that Fielding’s attentiveness to natural philosophy has remained a critical blind spot. Almost by rote, scholars refer to Fielding’s “consistently satirical attitude towards [scientific] enterprises,” and his “consistent attitude towards the virtuosi and the natural (or rather, in his opinion, unnatural) philosophers of the Royal Society.” For some, Fielding’s apparently anti-scientific project is theological. They argue that his conception of nature was not Baconian, “but rather the Christian humanist conception of la belle Nature, Nature as ideal form and universal type.” Others hold fast to the notion of Fielding as a classical humanist who regarded the crassness of experimental knowledge as a key indicator of a civilization in decline, and thus he satirized the Royal Society


17 Battestin, *Tom Jones*, 701n.
to demonstrate “the absurdity of this latter-day ‘learning.’” An absence of substantive scholarship on the topic encourages unreliable assumptions: for instance, that he disdained callous animal experimentation, which offered no understanding of man’s place in God’s creation. This is why, say animal ethicists Rod Preece and David Fraser, he “penned a satirical and caustic parody on Experiments on the Cuttlefish [sic] by Abraham Trembley, as reported in the proceedings of the Royal Society.”

These and similar suppositions greatly exaggerate Fielding’s antipathies towards science, ignore the context of his scientific parodies, and mistake his parodic treatment for satirical attacks. Fielding scholarship is in need of a reconsideration of his burlesques, parodies, and satires of the Royal Society, akin to Gregory Lynall’s reconsideration of Swift and science. Many of Fielding’s works do indeed find humour in stock scientist figures, as in The Author’s Farce (1730), where among the spirits imported for the Goddess of Nonsense are included “One hundred Poets, Players, Doctors, and Apothecaries, Fellows of Colleges, and Members of the Royal Society.” Another example is Pasquin (1736), in which an envoy from the Royal Society offers the Queen of Ignorance a tribute that includes “A Horse's Tail, which has a Hundred Hairs/ More than are usual in't; and a Tooth/ Of Elephant, full half an Inch too long.” Yet these opportunistic jabs offer scant insight into this prolific writer’s sensitivity to advances in knowledge made by the Royal Society and other scientific bodies. A closer examination of his apparently anti-scientific writing reveals a greater respect for science than has thus far been acknowledged.

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Contrary to pronouncements that he “did not understand scientific thought and work,” Fielding’s regular burlesquing of virtuosi and their experiments evinces a solid grounding in popular science and the conventions of scientific writing. This is most apparent in his Royal Society parodies, beginning with a pamphlet entitled *Observations and Experiments upon the Terrestrial Chrysipus, Golden-Foot or Guinea*, published as a stand-alone piece in 1743, and reprinted in his *Miscellanies* later that year. Scholars habitually uphold *Terrestrial Chrysipus* as proof of Fielding’s eminence in a supposed culture war between eighteenth-century empiricists and humanists. Yet science is at best a peripheral target, here and in his subsequent parodies, an *Attempt Towards a Natural History of the Hanover Rat* (1744), of near-certain attribution to Fielding, and a Lilliputian debate between virtuoso ants, published in *The Covent Garden Journal* (November 11, 1752). Characteristic of his scattershot style, these parodies employ scientific discourses to frame social, political, and philosophical criticism, alongside incidental humour and wordplay.

1. Parody and Polyps: *Terrestrial Chrysipus* in Context

Henry Knight Miller’s 1961 book, *Essays on Fielding’s Miscellanies*, specifically his reading of *Terrestrial Chrysipus*, has set the tenor for discussions of Fielding and science. Miller parses the humour carefully, but is less rigorous in ascribing motivation. He writes, for instance, that

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“The Society’s indefatigable curiosity about any and all natural wonders seemed to literary men such as Fielding not only indiscriminate but meaningless.”

Miller traces the pamphlet to an article published in the *Philosophical Transactions* regarding Swiss naturalist Abraham Trembley’s discovery of a regenerating polyp, now known as the hydra. Yet Miller overlooks the cultural significance of Trembley’s discovery, and instead reads *Terrestrial Chrysipus* as a generic affront to empiricism and related social ills. Miller does acknowledge, in passing, that the Society is but one target in the parody’s “sweeping commentary upon the vices and follies of humanity at large.”

However, *Essays* remains the go-to source for those seeking evidence of Fielding’s role in “a long tradition of humanist attacks on science.” Prominent scholars have consistently cited Miller in order to maintain broad claims of Fielding’s “satirical perspective” on, and “openly satiric attitude” towards, the Royal Society. Crucially, Miller conflates Fielding’s parodic appropriation with satirical criticism, an error that continues to inform thinking on the topic. Subsequent scholarship has maintained the assumption that Fielding’s scientific parodies are primarily censorious, overlooking their nuanced participation in a larger cultural dialogue.

Miller can be forgiven for missing some of the subtlety in *Terrestrial Chrysipus*, since the *Essays* emerged out of a long scholarly tradition that emphasized Fielding’s forthright Christian virtue. Only a decade earlier, James A. Work had proclaimed that “the more enlightened critics of Henry Fielding have hailed him as an upright man, a great moralist, and an earnest worker for reform.” A few years after that George Sherburn echoed Work’s sentiment, more concisely asserting that “Fielding was fundamentally a moralist.” It followed naturally from such

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28 Miller, 328.

29 Miller, 332.


assumptions that Fielding regarded humour as a means to express his rigid principles. According to W.R. Irwin, Fielding “fought for light and order with the varied weapons of satire.” 34 Fielding scholarship was further hampered by those who accepted his moralism as sincere and unreflective. As Martin Battestin puts it, “metaphysics and gravity were not congenial to Fielding,” as he was the kind of common-sense humourist who “would rather be right than profound.” 35 Thus, the scholarly climate was such that Miller encountered no objection to placing Fielding among “the greatest comic authors […] and] earnest moralists,” as he does in his introduction to Fielding’s Miscellanies. 36 Nor was Miller challenged on his blunt assertion that “the Royal Society inspired consistently hostile passions in Fielding and most of his humanistic contemporaries.” 37 There were, however, a few dissenting voices, which Miller might have consulted for a fuller understanding of Fielding’s scientific burlesques.

William Empson’s sensitive account of “double-irony” in Tom Jones applies as easily to Terrestrial Chrysipus and other such writings. 38 Unlike conventional irony, which censures its target by feigning admiration while winking at a canny audience, Fielding’s double irony evinces sympathy for those on both sides of an issue, allowing each (or, Claude Rawson would say, neither) to claim the author as their ally. Fielding’s talent for appropriating the scientific voice to explore peripheral social iniquities enables him to occupy a perfectly indeterminate position. While his scientific burlesques maintain a tone that implies satirical critique, they stop short enough that such allegations must necessarily exceed the textual evidence. Thus, Fielding’s fundamentally ironic posture renders his true position on empirical science ultimately unknowable (assuming such a position existed in the first place). Eleanor Hutchens builds upon Empson, further undermining assertions that Fielding’s humour was didactic and moralistic. Like


36 Miller, Miscellanies, xvii.

37 Miller, Miscellanies, xl.

Empson, she argues that Fielding’s chief literary mode was irony, and that he was particularly
drawn to the dialectic irony of Lucian, whom he acknowledged as the master of the craft.\textsuperscript{39} Miller was, of course, well aware of Lucian’s influence on Fielding, having already published what remains one of the most meticulous comparative analyses of their literary styles.\textsuperscript{40} But here again Miller remains bound by the notion that “Fielding had the instincts of the moralist who is also a humorist.”\textsuperscript{41} Hutchens broadly concurs with assertions to the effect that Fielding admired Lucian for “hammering at the same follies and vices that he himself was most concerned to attack.”\textsuperscript{42} Unlike Miller, however, she emphasizes Fielding’s debt to a “fragmented or unsustained Lucian,” whose dialogic style makes it difficult, at times impossible, to determine whether his target was a specific adversary, or merely a general type.\textsuperscript{43} The crucial insight that Empson and Hutchens share is Fielding’s penchant for a kind of heteroglossia that is more accurately regarded as parody than as satire.

Approaching Fielding’s burlesques in terms of parody allows for vastly different avenues of interpretation than have so far been explored. Parody and satire are close cousins, frequently overlapping in form and function. Both modes appropriate the voice of a source text, though frequently to different ends. The key difference is that, unlike parody, satire is nearly always corrective. Whether gentle or harsh, it aims to expose and criticize some deficiency in its target. Parody, on the other hand, is less purposeful. Its precise workings remain in dispute, but no major theory regards it as essentially disciplinary. Fredric Jameson comes closest to ascribing a singular motivation for parody, tortuously figuring it as a means of imitating the idiolect of a dominant class in order to claim its authority.\textsuperscript{44} However, this no more explains the mechanisms


\textsuperscript{40} Miller, 365-419.

\textsuperscript{41} Miller, 383.

\textsuperscript{42} Miller, 367.

\textsuperscript{43} Hutchens, 28-29.

\textsuperscript{44} Fredric Jameson, \textit{Postmodernism: or, the Cultural Logic of Late Capitalism} (Durham: Duke University Press, 1991), see especially 16-17.
in parodies like *Terrestrial Chrysipus* than does the assumption that they are corrective satires. Linda Hutcheon offers a far more compelling theory, defining parody merely as a form of imitation, which may condemn or celebrate a text, or may simply register its cultural significance. Using a pertinent example, she observes that Fielding’s novel *Joseph Andrews* is generally regarded as a parody of Richardson’s novel *Pamela*, but it is, in fact, both “a satiric parody of *Pamela* and a respectful parody of *Don Quijote*. “45

A minor weakness of Hutcheons’s theory, common among postmodern scholars who have done the most work on the topic, is its supposition that there is something uniquely productive about the parody of her own age. Unlike earlier modes, she claims that “parody in the twentieth century has gone beyond [the] conservative function of keeping modishness in line” and has evolved to become “one of the major modes of formal and thematic construction of texts.”46 This claim would surprise eighteenth-century theorists, who clearly regarded parody as creative enterprise.

Samuel Johnson’s dictionary defines parody as “a kind of writing, in which the words of an author or his thoughts are taken, and by a slight change adapted to some new purpose.”47 Robert Chambers offers perhaps the most helpful theoretical model to account for the multiple valences of Fielding’s scientific burlesques. According to Chambers, parody is not a genre, but a technique. The parodic technique divides into three main variations, which he refers to as “banging,” “binding,” and “blending”.48 The first variation “bangs” together art and life, obscuring the boundaries between the two. We see this technique in Scriblerian representations of Dr. John Woodward, which confuse distinctions between Woodward the person and Woodward the satirical construct. The next variation “binds” literary genres or modes, as with Elizabeth Hamilton’s *Memoirs of Modern Philosophers*, which fuses elements of domestic novels with those of scientific burlesques. The final variation “blends” disparate conventions in order to create a new form. An example of this is Samuel Johnson’s *History of Rasselas*, which


46 Hutcheon, 2.


48 Robert Chambers, *Parody: The Art that Plays with Art* (New York: Peter Lang, 2010), see especially 3-47.
Combines tropes of oriental tales with musings upon modern science, thereby creating a unique philosophical medium.\textsuperscript{49} The strength of Chambers’s model is that it recognizes parody’s infinite potential for complexity. His variations do not demarcate autonomous categories but basic constructive elements. They are, to use his metaphor, like primary colours on a colour wheel.\textsuperscript{50} Even Hutcheon’s theory, for its considerable merit, urges us to settle on parodic intentions. However, \textit{Terrestrial Chrysipus} does not divide neatly into categories of “satiric parody” and “respectful parody”. As will be discussed, the pamphlet contains obvious satiric elements, but its attitude towards Royal Society science is irreducibly complex, and it ultimately forces readers to decide for themselves what Fielding intended with the piece.

\textit{Terrestrial Chrysipus} plays with audience expectations by offering itself as something between a familiar scientific satire and a sympathetic acknowledgement of a culturally significant discovery. No doubt some eighteenth-century readers, like twentieth-century scholars, approached the pamphlet as a routine sendup of Royal Society science. However, Fielding does not corral us into that conclusion. He rather appropriates a topical scientific document in order to comment upon broad social vices, creating an ironic distance between the source material and his acknowledged targets. The humour of the piece operates in multiple registers, but it crucially plays on what John C. Meyer calls a “shared social script,” wherein a cultural reference evokes a sense of “common understanding and group membership.”\textsuperscript{51} Indeed, the details of the pamphlet testify to his faith in his audience’s familiarity with the original. It was safe to assume that a healthy segment of his readership knew of the prime text since newspapers had for months been reporting on Réne-Antoine Ferchault de Réaumur’s account of the polyps to France’s Académie des Sciences.\textsuperscript{52} And the week leading up to \textit{Terrestrial Chrysipus} saw several papers across

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\textsuperscript{49} I take these examples from chapters 2, 4, and 5 of this dissertation.
\textsuperscript{50} Chambers, 6.
\textsuperscript{52} Including the \textit{London Evening Post} no. 2344 (November 16, 1742); the \textit{Daily Post} no. 7239 (November 17, 1742); the \textit{Universal Spectator and Weekly Journal} n. 737 (November 20, 1742); and the \textit{Westminster Journal or New Weekly Miscellany} no. 52 (November 20, 1742).
\end{flushright}
London advertising a six-shilling copy of “Several Papers read before the Royal Society, concerning the Fresh-Water Polypus.”

By 1743, Trembley had achieved notoriety among many of the same readers that comprised Fielding’s audience. Trembley is still considered “the father of biology” by many, both for his specific discoveries and for his methodological contributions to the life sciences. Equally significant was his influence on public engagement with scientific research. In the early 1740’s Trembley claimed to have discovered an animal capable of regenerating severed limbs, and, even more remarkably, regenerating a miniature version of itself from the limbs that had been severed. Naturally, this fantastic creature was the subject of much curiosity amongst specialists and non-specialists alike, but it tested the credulity of both. England’s scientists knew of Trembley’s experiments, but despite accounts in their journals and the unimpeachable character of those who vouched for them, the experiments were not universally accepted as credible fact. Instead, they were subject to “skeptical criticism, jokes, and ironic remarks.” It was not until Trembley demonstrated the experiments before the Royal Society in March of 1743 that the snickering ended and the sceptical jokes desisted.

While Trembley’s experiments were eventually authenticated, gaining recognition had been a struggle at home and even more so abroad. His main obstacle had been the impossibility of providing his sceptics with a firsthand experience of his work. In the summer of 1742, however, he conceived a way to circumvent this problem. He devised an ingenious method for shipping live polyps while also making his research notes and methods widely available. Thus, it became possible for doubters to replicate the experiments for themselves from anywhere on the globe. This strategy proved remarkably successful. Within the space of only a few years international

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53 Among the papers running this advertisement were the Daily Gazetteer no. 2369 (January 25, 1743); the London Daily Post no. 2581 (January 28, 1743); and the London Evening Post no. 2376 (January 29, 1743).


55 Ratcliff, 560.

56 Ibid.
communities developed extensive networks for distributing and documenting such research, effectively delocalizing scientific authentication.\textsuperscript{57} This new manner of verification had a considerable impact on an already waning culture of scientific pageantry. The credibility of an experiment no longer rested on proximate witnessing. Consequently the exclusivity of scientific demonstration was increasingly supplanted by a publication culture that brought experimentation to much larger communities.

The polyp remained a mini-sensation throughout the 1740’s, much to the detriment of the countless marine animals across Europe mutilated by naturalists in search of other regenerating creatures.\textsuperscript{58} It would have been difficult for anyone reasonably attuned to the events of the day to miss the significance of the polyp. Miller’s claim that “these apparently trivial studies of the polyp” were a source of amusement for “a humanist like Fielding” would be dubious if Fielding had only a glancing interest in science.\textsuperscript{59} He evidently had more than that, as his estate catalogue attests. The known fragments of his library include a selection of scientific books and articles that stand out in an otherwise predictably canonical collection. Among the notable inclusions are a five-volume edition of Boyle’s Works (1744), Colin Maclaurin’s Account of Newton’s Discoveries (1750), Henry Pemberton’s Views of Newton’s Philosophy (1728), and the complete eight volume set of the Philosophical Transactions of the Royal Society from 1665 to 1733.\textsuperscript{60} Not surprisingly, the catalogue also contains a copy of the Society’s Papers concerning the Fresh-water Polypus, which Fielding would parody within a month of its publication, as well as a second account of polyp experiments by Royal Society scientists Martin Folkes and Henry Baker titled An Attempt towards a Natural History of the Polype (1743).\textsuperscript{61} This, along with the

\textsuperscript{57} Ibid.


\textsuperscript{59} Miller \textit{Essays}, 315.

\textsuperscript{60} Ribble and Ribble, 45, 211, 243, 274.

\textsuperscript{61} Ribble and Ribble, 274, 27.
original account of Trembley’s polyp, would serve as source material for An Attempt towards a Natural History of the Hanover Rat.

Fielding is not the only humourist of his time to exploit the polyp’s celebrity for a laugh, though he is gentler about it than many of his contemporaries. Tobias Smollett’s Adventures of Peregrine Pickle (1751) has a Trembley-figure boasting that he pioneered a method “of collecting, preserving and hatching the eggs of [marine insects].” At this, the hero laughs in the face of the “muck-worm philosopher,” inviting his companions and readers to do likewise. Oliver Goldsmith similarly scorns Trembley and his ilk in The Citizen of the World (1762) wherein the traveller Lien Chi upbraids naturalists for the laborious minutiae of their work. He recounts to his correspondent how English scientists “view all nature bit by bit, now the proboscis, now the antennæ, now the pinnæ of—a flea. Now the polypus comes to breakfast upon a worm; now it is kept up to see how long it will live without eating; now it is turned inside outward, and now it sickens and dies.” While Smollett, Goldsmith, and others tilt their satires towards the unproductivity of Trembley and his fellow naturalists, and even accuse him of fabricating his discoveries, Fielding’s account of the Terrestrial Chrysipus never impugns Trembley or his discovery.

1.1. Ants, Polyps, and Hanover Rats: Fielding’s Scientific Burlesques

Rather than targeting Trembley, Terrestrial Chrysipus adopts a scientific tone to ridicule various manifestations and consequences of greed and cultural degradation. Fielding refigures Trembley’s regenerating polyp as a self-replicating coin, as is apparent from the prominent illustration of a Queen Anne guinea on the first page, the original guinea of Great Britain (Figure


2). Formally, Fielding’s pamphlet closely imitates the original article, and he quotes many passages verbatim. Others he alters slightly, stippling the piece with as many little jokes as will fit. The smallest details provide occasion for fugitive quips. For instance, where the original reads, “Translated from the French by P.H.Z. F.R.S., [Philip Henry Zollman Fellow of the Royal Society],” Fielding’s reads “Translated from the French by P.H.I.Z. C.G.S.” Not intended as an acronym with any particular meaning, P.H.I.Z. recalls “phizz,” a vulgar abbreviation of “physiognomy,” which Jonathan Swift repeatedly cites as an example of monosyllables that have arisen to “the Disgrace of our Language.”65 “C.G.S.” Presumably stands for Covent Garden Society.

Figure 1. Artist Unknown, Terrestrial Chrysipus. Courtesy of the Lewis Walpole Library, Yale University.

Such jests are indicative of pamphlet’s diffuse style. Very little humour comes at the expense of the Royal Society and none at the expense of Trembley. Neither does Terrestrial Chrysipus assume a sceptical position about the existence of regenerating polyps. In fact, criticism of science, even of the indirect sort, is largely absent, though Fielding does laugh at the pretentions of cultural over-reachers. He peppers Terrestrial Chrysipus with superfluous bits of Greek in the fashion of a semi-learned naturalist whose insistent claims to authority belie his lack of proper learning. The pamphlet repeatedly mocks such unearned gravitas while simultaneously deflating the classical diction into a series of bawdy puns. His diagram of the chrysipus includes “Four tubes, representing the Ἰἱός, or Man’s Staff” (195), and shortly thereafter he writes “I have by

the help of my Microscope discovered some of its Parts … which bear great Analogy to the Ἄιδια [pudenda] of the human body” (196). Along similar lines, Fielding parodies the pretensions of an uppish virtuoso by placing the figure of the experimenter before the paper’s actual subject matter. The faux-scientific diagram of the guinea remains largely unlabelled, while the observer’s hand is accounted for in absurd detail: “A. denotes the Ruffle [of the researcher’s sleeve]. B. the Hand. G. the Thumb of that Hand. D. the Finger. E. the Part of that Finger to which the CHRYSPUS sticks” (195). Not meant to represent any specific member of the Royal Society, the experimenter is a second-rate scientist who speculates, for example, on whether an oyster should be properly considered an animal, a matter which he claims “is not yet settled by the Learned to be absolutely a vegetable” (197). This passage invokes a dispute about the oyster’s place in the great chain of being, which had lost its urgency several decades earlier. By 1743, anyone worthy of the appellation “Learned” would absolutely categorize the oyster as an animal.

Characteristic of Fielding’s scientific parodies, these sendups of the stereotypical virtuoso comprise only a small part of the work. The nearest thing to a primary target in the piece is a usurer’s greed. Fielding replaces Trembley as the experimenter with “Petrus Gaulterus,” an obvious stand-in for Peter Walter, the notorious money-lender and Walpole supporter on whom Fielding based Peter Pounce in Joseph Andrews (1742). In essence then, the piece is an extended metaphor for a financier’s wealth, presented in the idiom of a naturalist. Fielding, as Gaulterus, reports that the “Chrysipus of the larger kind may be subdivided into one and twenty substances […] these may be again subdivided each of them into twenty-four” (199). These are, of course, the same properties as the guinea, which can be subdivided into twenty one shillings, and each of these into twenty four halfpennies. Gaulterus describes his attempt to breed these creatures, but finds they do not reproduce sexually. He writes, however, that he has “tried a Hundred of them together… [and] they were found in the year’s end to produce, three, four, and sometimes five, Chrysipi” (198-99). In other words, a large enough stake allows an unprincipled moneylender to accrue outrageous interest on his loans. Fielding leaves meticulous accounts of Trembley’s dissections untouched, chuckling instead at Gaulterus’s lofty accounts of his own miserliness, writing that “A Chrysipus, by the simple Contact of my own Finger, has so closely attached itself
to my Hand, that by the joint and indefatigable Labor of several of my Friends, it could by no means be sever’d, or make it quit its Hold” (198). As Hutcheon might put it, *Terrestrial Chrysipus* is not so much a satire of the Royal Society as it is a satiric parody of Walter combined with a respectful parody of the Royal Society.

Yet, while Fielding upholds Walter as a figure of greed, most of the humor is too broad to really classify it as a satire upon a single person. Among this creature’s strange properties, for instance, is the power to turn “Black into White, or White into Black” (29). Additionally, it has the ability to make a “Man talk for several hours… [and] say whatever the person who sticks it on desires: And again, if you desire Silence, it will effectually stop the most loquacious Tongue” (29). It is unlikely that Fielding has Walter in mind in either examples, as both of are typical motifs in his broad attacks on the culture of corruption that seemed to characterize the Walpole era. Readers may, for instance, may detect similarities between this dissembling creature and the life-writing Parson that the harlot Shamela selects write her biography on the basis of his special talent to “make black white.” The Chrysipus’s second ability is likewise a generic comment on the corrupting influence of money, and perhaps an oblique jab at the Walpole administration, which was constantly attacked for bribing its critics. We might even imagine a subtle joke at Fielding’s own expense for having taken money from the administration to do a political about-face, transforming from one of the administration’s most vocal opponents to “in all appearance, a ministerial propagandist.” It is even more doubtful that Fielding has the octogenarian Walter in mind when he refers to the Chrysipus as “the Strongest Love Powder in the World” (30). The tone of *Terrestrial Chrysipus* is too playful, and the targets too fleeting for it to function as a strong satire of anything in particular. The same holds true for *Hanover Rat*, which is conceived in much the same style.

*Hanover Rat* surpasses its predecessor in demonstrating Fielding’s familiarity with scientific culture, acknowledging several important publications in the field. In his preliminary enquiries

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into the nature of the Hanover Rat, Fielding’s narrator first consults eminent texts, including the *Philosophical Transactions*, Frederick Ruysch’s *Thesaurus Animalium Primus* (1710), and Richard Bradley’s *Philosophical Account of the Works of Nature* (1721). Finding no mention of the rat, the learned narrator addressed himself “by way of Letter, to those celebrated Naturalists Mr. Trembley, Mr. Lewenhook of the Hague, and Mons. Raumure of Versailles, author of *Memoires pour server à l’Histoire des Insectes*, to know whether this Animal had ever fallen under their Observation” (660). Intended in no way to minimize these men or their work, Fielding’s small tributes to Trembley, Antonie van Leeuwenhoek, and Réaumur establish the author’s own intellectual credentials.

Like *Terrestrial Chrysipus*, *Hanover Rat* borrows its basic structure and much of its phrasing from its source, in this case Baker’s follow-up account of Trembley’s polyp. Also like *Terrestrial Chrysipus*, *Hanover Rat* contains very little direct criticism of the Royal Society or its affiliates. Rather, it aims its satirical focus on contemporary politics, castigating Hanoverian King George II for greed, wastefulness, and for a primary loyalty to his native Germany. Fielding revisits the metaphor of a Hanover Rat several times in *Tom Jones*, as when the jingoistic Squire Western sneers “Hanover Rats. Pox!” and later “I am no Rat. I am a true Englishman, and not of the Hanover breed, that have eat up the Nation” (321, 337). In a naturalist’s vernacular, *Hanover Rat* enquires into the nature of a peculiar breed of vermin that can grow to the size of an elephant, gorging itself on silver and gold, though willing to feed on “every Thing that comes within its Clutches” (662). These avaricious beasts, he writes, “will not allow an English Rat, if it were starving, to touch one of their Hoards” (662).

*Hanover Rat* continues to find convenient humour in routine sendups of natural philosophers, but the corrective energy disperses equivocally between those who waste their time and money on preposterous naturalistic pursuits, and those who unthinkingly criticize intellectual labours that elude their limited understanding. Burlesque natural philosophers arise once again as our narrator lauds two esteemed scientists of his acquaintance, an “ingenious German Artist, who spent twenty years making a Chain to bind a Flea” and a “learned member of the Royal Society, who hath spent fifty Years making a Collection of Butterflies and Cockle-Shells” (667). Yet there are telling moments in which the narrator’s irony gives way, and Fielding earnestly scorns those
“who expect to receive some Benefit from the Labours of the Learned, [but] look upon all these Things as ingenious Fooleries” (667). Thus, a clear tension emerges between accusations that science is a trivial field of knowledge, and a simultaneous resistance to such accusations.

Several moments in *Hanover Rat* bespeak ambivalences concerning the value of naturalism and the knowledge it produces. Fielding oscillates between criticizing scientists—like the ingenious German and the Royal Society collector—for failing to produce useful knowledge, and meditating upon the intrinsic value of learning. In taking seriously the notion of knowledge for its own sake, Fielding is at the fore in a broad cultural turn, anticipating the likes of Samuel Johnson who argue that even as a frivolous hobby, natural history can be morally beneficial as it “fix[es] the thoughts upon intellectual pleasures, resists the natural encroachments of sensuality, and maintains the mind in her lawful superiority.”68 *Hanover Rat* opens on a similar sentiment, lauding Fielding’s “ingenious Friend Mr. Baker, in his Natural history of the Polype,” and quoting Baker’s address to Folkes:

> Curiosity and a Fondness for Novelty are implanted by the Providence in the Mind of Man, to make him observe and examine Things attentively, distinguish their various Productions, Form, and Structure, and admire their Beauties, Properties, and Use: Whilst he is doing this, he is improving his Judgement, performing his Duty, and making himself happy. (659-660)

By endorsing scientific curiosity as a providential gift, Fielding diverges from traditional complaints about the fecklessness of empirical study. Even the ridiculous fellow of the Royal Society who spent over half a lifetime on his childish collection of butterflies and shells must be afforded some measure of dignity when considering the dedication with which he distinguished his collection’s “form and structure, and admired [its] beauties.” And while such a collection does not have much apparent use, it is difficult to scoff at a man who spent five decades making himself happy at no one’s expense. The inclusion of Baker’s address concretizes the troubling question of what kind of science is to be admired and what kind is to be ridiculed. Ultimately,

Fielding is unable to declare any branch of science objectively worthless, which is perhaps why he finds so little to criticize in contemporary scientists, and why, years later, he chose to intervene in a scientific controversy from his grandparents’ generation.

The *Covent Garden Journal* parody looks back on seventeenth-century debates over whether or how science might explain Noah’s flood, maintaining the same equivocal attitude of his earlier works. The original dispute, sometimes referred to as the Hooke-Halley debates, played out in Society publications and a few libellous pamphlets throughout the 1680’s and 1690’s. Portions of the dispute were republished in a 1724 issue of the *Philosophical Transactions*, contained within Fielding’s library. Though naturalistic explanations for biblical phenomena were no longer of pressing concern for mainstream science of the 1750’s, scholarship reflexively attributes the article to “Fielding’s persistently satirical view” of the Royal Society and other “scientists of his day.”69 However, several elements throughout the piece raise doubts about whether the satire is actually anti-scientific at its core.

Had Fielding intended to target the Royal Society of his day, he could easily have chosen to satirize a topical scientific controversy. Instead, he reframes a previously high-profile debate in a way that highlights the primitiveness of all participants, and, in doing so, he pays a backhanded tribute to the comparatively advanced science of his own time. In his amusing retelling, the learned virtuosi of an ant colony theorize the natural causes of a recent deluge. The ant scientists employ all the empirical evidence available to them, along with a great deal of speculation, to posit explanations for the phenomenon. They do so with great pomp and lofty jargon, but they are hopelessly ill-equipped to ascertain the true source of the deluge—a cow urinating on their anthill. Fielding contours the parody with several references to the source material, but this pastiche does not constitute a hostile satire.

Underscoring the distinction between the science of his lifetime and that which came before, Fielding neatly divides the article into two parts. The first is a discussion of William Gould’s 1747 book, *An Account of English Ants*. Fielding applauds the book, and laments that “the Name of the Reverend Mr. Gould, tho’ a Gentleman, a Scholar, and a Master of Arts, is not yet famous

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in the Republic of Letters” (368). There is no reason to doubt Fielding’s praise for his cousin and close friend with whom he shared a publisher, and whose books he frequently puffed in *The Covent-Garden Journal*. Thus we need not be sceptical when Fielding commends Gould for the moral lessons he draws from “this surprising insect,” and calling attention to the colony’s “incredible Affection towards their young,” “the Obedience they pay their respective Queens,” “Their incessant Labours,” “The unanimous Care exerted by each Colony for the common Emolument,” “their Economy”; “their Sagacity and Wisdom &c” (368).

Where he does find fault in natural philosophy, he once again resorts to types. The bulk of the humour derives from the self-important, jargon-laden, dialogue between “that mighty Ant, Dr. Hook[e],” who argues that the flood occurred as a result of the earth being squeezed by some celestial force; and “the egregious Ant [Halley]” who contends that a comet changed the rotation of the earth “occasion[ing] a Puddle of Water to recede from those Parts, towards which the Poles did approach, and… encrease upon and overflow those Parts wherefrom the Poles were departed” (372). The parody is brilliantly layered, from the deflating image of ant scientists orating atop a piece of dirt “about thrice as large as a moderate Pin’s head” (370); to the ants’ garrulous explanation for the flood, which basically amounts to “it rained”; to the baseness of the actual cause. Rather than rebuking the “pride and presumption of the modern scientist,” as has been asserted, the piece reads as a comparatively light chuckle at seventeenth-century scientists, and overweening philosophers in general.70 The article concludes with a gentle reprimand of Christian virtuosi, like those of the nascent Royal Society, for whom empirical investigation was a means to reclaim an unfallen communion with the created world. To these men Fielding asserts, “there are some Subjects on which a Wit and a Blockhead, a Man and an Ant, will exert themselves with the like success” (374). Yet he applies the same lesson to Aristotle’s meritorious *De Anima*, which he hails as “a Treatise on the Soul [that] will require some Degree of Genius to equal” (374). Clearly then, Fielding’s purpose is not to expose the “irreligious pride” of scientists who “seek to exceed the limits of human intellect.”71 Rather, it is to remind his reader there are


71 Goldgar, “Flood Makers,” 144.
some mysteries which we will never have sufficient evidence to solve, and which must elude even the greatest thinkers.

2. Periodicals and Popular Science

It is probably no coincidence that Fielding’s most involved scientific parodies emerged during the periodical phase of his career. As Goldgar notes, Fielding spent at least three and a half years immersed in the dynamic world of journalism, “a genre rooted in the present day and responding to immediate events or interests.”\textsuperscript{72} In addition to reporting political developments in real time, periodicals were the primary medium through which publics engaged with the newest discoveries of the Royal Society and their international counterparts. Science is never a main theme of Fielding’s periodical writing, but he does occasionally poke fun at the Royal Society and Royal College of physicians. This is particularly true of \textit{The Champion}, in which two of his personas are closely associated with empirical science. These are John Vinegar, physician and admirer of the Royal Society, and Job Vinegar, a mariner, like Lemuel Gulliver, whose travels often provide occasion for musings on Royal Society knowledge. As with his longer burlesques, though, science and medicine are rarely the primary targets. When science does receive more than a passing mention, it is generally a vehicle to contemplate unrelated matters. In a 1740 letter to \textit{The Champion}, the putative author, “J. Nobob,” complains about Walpole’s 1739 Treaty of El Pardo, which he likens to a newly fictional nostrum called “\textit{Aurum potabile}, or liquid Gold.”\textsuperscript{73} In 1746, \textit{The True Patriot} ran a short article in the voice of a virtuoso who describes an invention by one of his colleagues, a thermometer that measures degrees of sense, with madness at one end, and good sense in the middle.\textsuperscript{74} This barometer of sense was not Fielding’s brainchild. He borrowed the basic premise from Joseph Addison and Richard Steele who had previously written of various glasses of the sort. The \textit{Tatler} imagines similar gauges, both political (August 1710)


\textsuperscript{73} Fielding, \textit{Champion}, 376-380, 377.

\textsuperscript{74} Fielding, \textit{True Patriot}, 250-256.
and religious (September 1710). And the *Spectator* writes of a fantastic microscope that can peer into a person’s heart (January 1712). Fielding’s own weatherglass may alternately be regarded as a tribute or a plagiarism, but, in either case, it clearly indicates that he was paying close attention to the literary culture around him, and he understood his readership to be acquainted with the basic language of science.

Newspapers and magazines had long been the site of greatest interaction between science and the reading public. Running from 1690 through 1697, the *Athenian Mercury* was among the first major papers to circulate in London. It popularized the model of collective exchange, in which readers submitted questions on a wide variety of matters, including one of Dunton’s main personal interests, natural philosophy. The *Mercury* and its imitators empowered readers to evaluate scientific knowledge, which motivated increasingly refined interactions with current developments, such as Trembley’s polyp.

The *Mercury* was long defunct by the time of Fielding’s writing, but its project of bringing science to a non-specialist audience continued in numerous periodicals, foremost being Edward Cave’s *Gentleman’s Magazine*. In addition to its political and literary interests, the *Gentleman’s Magazine* was the leading vehicle for non-specialist dissemination of scientific knowledge. Alongside its amusing and curious accounts of new theories, species, and the like, the magazine discussed practical implications of the most current findings. Additionally, it printed accounts of new world expeditions, which simultaneously entertained readers and kept them up to date with the latest discoveries from around the globe. Public appetites for such material were strong enough that the *Gentleman’s* regularly ran summaries of articles from the *Académie* and, even

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more frequently, articles from the *Kungliga Vetenskapsakademien*, known in England as the Royal Swedish Academy of Sciences.\(^79\)

As one would expect, various fields of science went in and out of fashion. In the late 1730’s and early 1740’s, readers were most interested in articles dealing with mathematics and astrology. Demand for such contributions was so great that Cave saw fit to supplement the *Gentleman’s* with the *Miscellanea Curiosa Mathematica*, which contained questions, solutions, and essays all of a mathematical nature. For all the interest on such topics in *The Gentleman’s Magazine*, *Mathematica* was apparently too specialized to remain profitable. It ran only a few issues between May 1749 and August 1753.\(^80\) Even by the mid-1740’s, mathematical contributions began to decline in favour of medical articles. One of the more popular discourses was a series of articles debating Bishop Berkeley’s “egregious cure-all, Tar-water.”\(^81\) The *Gentleman’s Magazine* announced Berkeley’s *Philosophical Enquiry Concerning the Virtues of Tar-Water* in April 1744, and a few weeks later included a sizable extract from the book. It seems Fielding could be counted among those taken in by Berkeley’s panacea as his auction catalogue contained a copy of *Tar-Water* with the marginal observation that Berkeley was “one of the greatest scholars and best of men.”\(^82\)

By the late 1740’s, articles on electrical experimentation were filling the pages of magazines. The most popular of these recounted experiments described in John Freke’s *Essay to Shew the Cause of Electricity* (1746). Although a Fellow of the Royal Society, Freke’s credentials were as a surgeon, and his investigation into the nature of electricity lacked rigour. In many respects, his *Essay’s* real concern is with the mystical implications of “electrical fire,” which he figures as “the immediate Officer of God Almighty.”\(^83\) The conjectural *Essay* drew predictable scorn from

\(^{79}\) Carlson 156.

\(^{80}\) Carlson 24.

\(^{81}\) Carlson 160.

\(^{82}\) Ribble and Ribble 35.

more serious experimenters in the field. Notable among these was Benjamin Martin who prefaced his own *Essay on Electricity* (1746) by charging Freke with having “no more Notion of the Nature and Cause of Electricity, than he has of the Elements of Modern Philosophy.” But despite Freke’s lack of scientific credibility, his *Essay* found enthusiastic support in *The Gentleman’s Magazine*, which praised it for being “founded upon the most incontestable truths of natural philosophy, the laws of motion, the animal œconomy, and the experience of all ages.”

An ensuing pamphlet war with Martin helped secure Freke’s centrality in popular discourses regarding the mechanical and medical applications of electricity.

As with Trembley and his polyps, Freke’s account of electrical experiments provided grist for Fielding’s parodic mill, motivating two passing references in *Tom Jones*. These allusions seem to position Fielding among detractors such as Martin who satirized Freke as a philosophical Don Quixote, but they are ultimately too ephemeral to support Battestin’s claim that Fielding meant to condemn Freke’s “absurdly theoretical and pretentious work” (86n).

Fielding first winks at the *Essay* when he wishes “Mr. John Fr[eke], or some other such Philosopher, would bestir himself a little, in order to find out the real Cause of this sudden Transition, from good to bad Fortune” (86), and later describes a scene of domestic violence in terms of Freke’s electrical theory:

> the Virtue of this Medicine [Black George’s switch], like that of Electricity, is often communicated through one Person to many others, who are not touched by the Instrument. To say the Truth, as they both operate through Friction, it may be doubted whether there is not something analogous between them, of which Mr Freke would do well to enquire before he publishes the next Edition of his book. (187)

These passages are tempting to read as criticisms of contemporary science. Yet the text itself does not insist that we do so. The humour in both cases emerges more from the droll roundabout

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manner in which Fielding articulates a simple observation, and in the topicality of his reference, than from any obvious challenge to Freke’s theories. Certainly, there are implied chuckles at an eccentric figure, but these are easily readable as convivial jabs, especially considering that Freke and Fielding were personally acquainted. Fielding’s audience could enjoy such humour as insiders since popular magazines had made Freke’s experiments a matter of public concern. His arrogance offered potential for amusement, but his theories remained a source of interest. Rather than discrediting Freke’s work, Fielding’s wry observations reassert Freke’s status as a significant figure.

3. The Providence of Science in *Tom Jones*

Meditations on the cultural status of science percolate through *Tom Jones*, revealing its author’s ongoing interest in naturalism. The references are passing, and occasionally appear neophobic in aligning science with the baseness of the modern age, but they are balanced with more considered reflections. In one instance, the narrator presents natural philosophy as just one front in a generational conflict in which traditional gentlemen of letters are soon to be displaced by a new kind of gentleman who is politically corrupt, morally debauched, and culturally uninterested:

> in an Age when the [older] Gentlemen abovementioned employed their Time in toasting the Charms of a Woman, or in making Sonnets in her Praise; in giving their Opinion of a Play at the Theatre, or of a Poem at *Will*s or *Button*s; these [young] Gentlemen are considering of Methods to bribe a Corporation, or meditating Speeches for the House of Commons, or rather for the Magazines. But the Science of Gaming is that which above all others employs their Thoughts. These are the Studies of their graver Hours, while for their Amusements they have the vast Circle of Connoisseurship, Painting, Music, Statuary, and natural Philosophy, or rather unnatural, which deals in the Wonderful, and knows nothing of Nature, except her Monsters and Imperfections. (701)

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In this burlesque reversal, the nobler pursuits of art, music, and high political discourse are reduced to hobbies by a new generation of gentlemen for whom corruption is the acceptable political order, gambling is a worthy vocation, and philosophy is an exercise in gawking at nature’s mishaps. With feigned generosity, Fielding commends these gentlemen for their “Wisdom and Vertù, parenthetically warning us to “take heed [we] do not read “virtue” (701). Readers will recognize this move from his Richardsonian parody Shamela (1741), wherein the harlot’s orthographic variation “vartue” emphasizes her lack of real “virtue”. Similarly, in Tom Jones the narrator’s faint praise of the modern philosophers’ “ vertù” implies a natural antagonism between the virtuousness of classical learning with the viciousness of science. Yet this short passage, from which the notion of “unnatural philosophy” originates, and which is frequently offered as proof of Fielding’s Augustan ethos, fails to encapsulate the novel’s equivocal treatment of science.

The apocryphal notion of an Augustan Fielding has proven a significant impediment to rigorous examinations of Fielding and science. The retrospective category insists upon straightforward binaries of “humanism” and “science”. It encourages uncritical acceptance of rigid hierarchies of knowledge, which Fielding’s work frequently resists. It has proven remarkably resilient for a concept that was factually discredited in the 1970’s with Howard D. Weinbrot’s book, Augustus Caesar in “Augustan” England, and has been regularly disavowed ever since. 88 The improbable durability of the Augustan label is no doubt attributable to the ease with which it allows us to bypass the ambivalence and complexity and that characterizes Fielding’s thinking. The Augustan bias encourages us to understand Fielding as a writer who is deeply invested in the divine principles of symmetry and proportion, and who thus spurns virtuoso collectors for their odious pursuit of God’s mistakes. The theory leaves ample room for Fielding and his contemporaries to venerate Newton’s sublime physics, which evoked images of an orderly and providential cosmos, but it insists that Fielding would not tolerate vulgar forms of naturalism that served only to catalogue nature’s abnormalities.

The Augustan myth continues, in subtle but important ways, to encourage misapprehensions about Fielding’s engagement with science. Joseph Drury’s article on “Science and Spectacle in Tom Jones” complicates assertions that Fielding’s writing reflects a necessary contest between pious literature and secular science, but Drury does not challenge that basic premise. He makes a strong case that Tom Jones is a culmination of Fielding’s growing appreciation for scientific performativity, charting an evolution away from early sympathies for the “Augustan critique of modern culture,” towards an eventual recognition of “the need to harness the public’s libidinal appetite for wonder in the production of enlightened knowledge.” Yet even this keen analysis of narrative machinery in Tom Jones is somewhat diminished by unnecessary references to Fielding’s “Augustan critique” of scientific spectacular. Local examples of Fielding’s ambiguity on the topic from Drury and a few others have expanded the scope of scientific practices that seem to have appealed to Fielding, but they have left intact the dominant assumption that he was at best indifferent to most types of empirical study. For instance, the scholarship of Jayne Elizabeth Lewis details the centrality of atmospheric metaphors in Tom Jones, and argues that Fielding’s “radically figural, even metafigural” references to atmosphere are intended to generate the “epistemological conditions” for a novel to be “not just read but somehow ‘experienced.’” Compelling though her readings are, Lewis only obliquely touches upon the possibility that Fielding was interested in atmospheric studies for reasons beyond their metaphorical value. This gap in Fielding scholarship owes much to inherited assumption that there has always been a mutual animosity between the sciences and the humanities.

Ironically, Fielding’s most cogent defence of naturalism is found in Tom Jones, a novel hailed as “the last and consummate literary achievement of England’s Augustan Age.” Though the novel regularly chuckles at scientific spectacle, it ultimately refuses to condemn even the least


reputable branches of natural philosophy. There is strong textual evidence to suggest that Fielding respected science enough to replicate aspects of its method in his narrative style. In his article on the “Augustan Realities” of science in popular culture, Simon Schaffer offers *Tom Jones* as a paradigm of the ontological conflict between moral and natural philosophy.\(^\text{92}\) Schaffer places Fielding foremost among the “Tory pietists” who rejected the mechanical philosophy of “Whig lecturers” such as Freke, whom Schaffer upholds as an exemplar.\(^\text{93}\) Despite the obvious shortcomings of these premises, Schaffer draws an important connection between experimental science and emerging literary modes. As he argues, Fielding wrote at a time when objective “fact” was eclipsing subjective “truth” as the epistemological category of highest value. Ironically, facts were only granted objective status once they achieved broad social consensus, which the lay public increasingly empowered to grant or withhold. Just as periodicals allowed readers to adjudicate the validity of scientific theories, emerging novel forms, with their pretense of impartial documentation, novels allowed readers to adjudicate on new theories of human nature. According to Schaffer, *Tom Jones*, and novels like it, took on a self-consciously anthropological role in order to provoke and mediate such conversations.

As a historian of science, rather than literature, Schaffer can be forgiven for missing the fact that Fielding’s anthropological project began several years earlier, and for missing the mark on Fielding’s cultural politics. Fielding’s novelistic epic *Joseph Andrews* adopts a naturalist’s vernacular in its declared intention to “describe not Men, but Manners; not an individual, but a Species.”\(^\text{94}\) As McKeon details in the *Secret History of Domesticity*, *Joseph Andrews* is a deliberate literary analogue to the scientific experiment, which begins in the “local, particular, and ‘private’ realm of common sense impression,” and ends in “the quantitative abstraction of the general and the common that is embodied in the ‘public’ laws of nature.”\(^\text{95}\) So too, McKeon


\(^{93}\) Schaffer, 305.


argues, does *Joseph Andrews* abstract and generalize about human nature “beyond the temporal and spatial confines of actual particularity.”\textsuperscript{96} While *Tom Jones* does not earn a mention in McKeon’s lengthy dialectic on modernity, the novel is no less invested than its predecessor in examining human nature in all its “prodigious variety” (32). On occasion, Fielding even acknowledges the empirical mindset of *Tom Jones*, as when a woman performs the “Experiment” of exposing herself to the “pernicious Principles of Methodism,” or when Jones considers an “Experiment” of proposing marriage in order to disenchant an unwanted admirer (431, 819). It is, however, tempting to overstate the scientific ethos behind these novels, and neither Schaffer nor McKeon address the complicating element of Fielding’s regular authorial intrusions, which belie assertions that he approached his texts with the impartial, disinterested, mind of a scientist.

Fielding’s narrative interventions, particularly in *Tom Jones*, have been variously interpreted. Battestin makes a plausible case—though one that neglects Fielding’s playfulness—that the coincidence-driven action of *Tom Jones* is intended to mimic the hand of providence. Battestin thus likens the mechanism of Fielding’s plot to “the great machine of the universe itself.”\textsuperscript{97} The novel regularly invokes the language and concepts of Newtonian physico-theologians, figuring the world “as a vast Machine, in which the great Wheels are originally set in Motion by those which are very minute” (225). And Fielding assumes the role of deus ex machina in order to parallel God’s interventions in the matters of men. In a deliberate affront to deists and materialists, Battestin argues, whose science would reduce the heavens and the earth to random matter, Fielding turns wheels in full view of his reader, plainly demonstrating how God maintains his order. John Bender takes nearly the opposite position, arguing that “Fielding’s presence in *Tom Jones*,” gestures towards “the work’s organization of the scattered experience of characters into the focused and methodical order of experiment.”\textsuperscript{98} For Bender, Fielding’s authorial interventions emulate the role of a mechanic like Boyle or Hooke, whose orchestration,

\begin{itemize}
  \item \textsuperscript{96} McKeon, *Domesticity*, 372.
  \item \textsuperscript{97} Martin C. Battestin, *The Providence of Wit: Aspects of Form in Augustan Literature and the Arts* (Oxford: Clarendon Press, 1974), 144.
\end{itemize}
far from invalidating it, makes the experiment possible in the first place. Contrary to Battestin’s model, which has Fielding constantly tinkering with the machinery of the story, Bender’s model has Fielding set narrative experiments in motion and then step back to allow his reader to observe various isolated features of humanity. Each model offers useful inroads to Fielding’s literary strategy, but each limits their explanatory scope by insisting we choose between two poles of authorial participation. As Fielding himself warns, his pedagogical method is considerably more subtle and irregular.

Fielding does not claim the position of God, nor does he liken himself to an experimenter. Rather, in the introduction to the first chapter, he compares himself to the keeper of a “public Ordinary” whose fare “is no other than HUMAN NATURE” (31, 32). While this appears to be a straightforward metaphor, its deceptive complexity models the novel’s overall manner of instruction. Fielding undercuts his own authority by admitting to the crass motivation for his anthropological task, declaring that his public house caters to all people “for their Money” (31). Moreover, he stops just short of admitting that he is willing to embellish or ignore inconvenient facts of nature, if doing so serves the more profitable task of amusing his audience, writing that “the Excellence of the mental Entertainment consists less in the Subject, than in the Author's Skill in well dressing it up” (34). Yet, in a typically layered fashion, this glib passage can as easily be taken as serious pedagogical theory. “Entertainment”, in an eighteenth-century context, did not necessarily describe light or frivolous pleasure as it nearly always does today. According to Johnson’s dictionary, it could alternately mean “conversation,” relating to its root verb, meaning “to foster in the mind.”99 Fielding is known to use “entertain” in the most serious sense of intellectual engagement or education. We find an example of this in his sister’s Familiar Letters, wherein he criticizes burlesque natural philosophers for making it their business to “elevate and surprise,” when it should be to “satisfy, inform, [and] entertain.”100 Thus, we may as easily read his above declaration as a statement on the most efficient manner of education. Moreover, his apparent claim that that the author’s presentation is of greater importance than the subject itself is not necessarily cynical or deceitful. The analogy between food and education is

100 Henry Fielding, Familiar Letters, 142.
one to which he returns throughout his work. Henry Power devotes large portions of his book *Epic into Novel* to the pervasive and ambivalent culinary metaphors in *Shamela*, *Joseph Andrews*, and *Tom Jones*, arguing that images of food in Fielding’s writing gesture towards the modish appetites of literary consumers, while at the same time recalling the high art of the Homeric tradition.\(^{101}\)

The innkeeper analogy in *Tom Jones* is similarly complex in simultaneously diminishing the novel’s subject matter, while asserting that the act of dressing up a topic is means of rendering its important lesson palatable to his reader. He makes this point most clearly in the *True Patriot*, where, in a similar analogy, he writes that a “Table too full with plain Dishes,” and “without any Decoration whatever,” can be “difficult to digest.”\(^{102}\) Thus, Fielding’s own model of author as innkeeper sits nicely between the maximally- and minimally-interventionist models of Battestin and Bender. Fielding assumes a providential role by inserting lessons into his own book of nature, but calls upon his reader to act as a scientist and tease these lessons out. This technique is best illustrated in a minor aside, when Black George serves the captive Sophia a surprising dinner. The culinary analogy appears conventionally censorious towards naturalist collectors, but subtly attests to the potential merit of their studies:

Sophia herself, after some little consideration began to dissect the Fowl, which she found to be as full of Eggs as George had reported it. But if she was pleased with these, it contained something which would have delighted the Royal Society much more; for if a Fowl with three Legs be so invaluable a Curiosity, when perhaps Time hath produced a Thousand such, at what Price shall we esteem a Bird which so totally contradicts all the Laws of Animal Œconomy, as to contain a letter in its belly. (842)

Upon first glance, this knotty passage seems to affirm pronouncements of Fielding’s Augustan critique. As Battestin asserts, it is an indicative moment in a novel that repeatedly admonishes Royal Society scientists, “who, by occupying themselves with freaks and oddities, had lost sight

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of Nature and of Nature’s God” (710n). Moreover, the repeated references to the strange creature’s monetary worth, implicate naturalism in a broader cultural slide towards commodity fetishism. Phrases like “so invaluable a Curiosity,” “at what Price,” and “Animal Economy” imply criticism of “the emergence of natural knowledge as a commodity.” Yet in an exemplary moment of double irony Fielding subtly upholds the value of Royal Society naturalism, or at least leaves his own position hopelessly indeterminate. He does so both by casting the sympathetic character Sophia as the metaphorical anatomist and by rewarding her “dissect[ion].” The author’s providential intervention has, after all, inserted a message into the specimen.

This passage is typical in its ambiguous treatment of science. Similar moments throughout the novel signal Fielding’s ironic misdirection. However, the most salient concession to Royal Society naturalism takes place over several chapters. The long episode concerning the man of the hill conclusively refutes the premise that Fielding considered natural philosophy and “Nature’s God” mutually exclusive. When Jones and Partridge first enter the man’s house, which they mistakenly believe belongs to an old caretaker woman, they are immediately struck by the museum-like quality of the drawing room, which is “adorned with a great number of knick-knacks and curiosities which might have engaged the attention of a virtuoso” (445-46). The contrasting manner in which Jones and Partridge approach this collection signals the importance Fielding places upon individual perspective: “While Jones was admiring these things […] Partridge sat trembling with the firm belief that he was in the house of a witch” (446). Fielding encourages our suspicion for several pages, heightening the impact when the owner reveals the high motivation behind his collection. As the man explains, he was once a young scholar led astray into the world of drinking, gambling, and womanizing. During this time he neglected his intellectual and moral pursuits in favour of worldly pleasures. At a low point in his life, however, he rediscovered the pleasures of virtuous learning. As he recounts, “The books which now employed my time solely were those, as well ancient as modern, which treat of true philosophy”

While Fielding emphasizes the man’s devotion to ancient philosophy, he makes a point of opening space for modern learning in the man’s studies.

Having regained his Christian perspective the man sees divinity in every facet of nature. As he asks rhetorically, “On what object can we cast our eyes which may not inspire us with ideas of [God’s] power, of his wisdom, and of his goodness?” (484). Where eighteenth-century readers would initially associate the man’s virtuoso collection with the kinds of amusing trifles so often mocked by the high-minded, the man explains how no object is so trivial that it does not offer itself of evidence of Nature’s God and that “there is not an insect, nor a vegetable, of so low an order in the creation as not to be honoured with bearing marks of the attributes of its great Creator; marks not only of his power, but of his wisdom and goodness” (484). For the man of the hill, as presumably for Fielding, there is no corruption in nature except for “Man alone” (484). Thus, Fielding neutralizes the material practices of natural philosophy. It is the character of the observer, and not the empirical method, that renders natural philosophy unnatural, and, as he slyly warns us, it is for fools like Partridge to see witchcraft in the study of nature.

Recognizing this sympathetic current in Fielding’s treatment of science does not force us to conclude that he was its great champion. He may not, as has been supposed, present the Royal Society as having a monopoly on intellectual over-reaching, but neither did he exempt them from this folly. His ambivalence reflects the incongruity of mainstream attitudes. As a self-fashioned conservator of taste, Fielding warned against the intellectual debasement that science was long seen to epitomize, but as keen cultural observer he engaged a broad readership that, like himself, possessed an unprecedented familiarity with modern empirical study. Science would remain subject to suspicion for decades to come, but it was quickly moving into the purview of the literate middling sort. Periodicals and other forms of media had largely democratized scientific knowledge, and as a result, outmoded tropes could no longer embody the perceptions of an increasingly conversant public.
Chapter 4
Luxurious Knowledge: Science, Progress, and the Oriental Chronotope

When the main characters of Samuel Johnson’s *History of Rasselas Prince of Abissinia* (1759) first encounter the Great Pyramid of Giza, they are struck by its geometry, and they are awed by “the extent of the base and the height of the top.”¹ Even before making camp at its foot, Rasselas and his companions survey and measure the ancient structure (115). After some reflection on the history and grandeur of the pyramid, the sage Imlac concludes it is “a monument to the insufficiency of human enjoyment,” and that any king “whose power is unlimited, and whose treasures surmount all real and imaginary wants, is compelled to solace, by the erection of a pyramid, the satiety of dominion and tastelessness of pleasures” (119). The oriental king, whom Imlac imagines, shares his intemperate desire for worldly pleasure with the Abbasidian Caliph and titular character of William Beckford’s gothic novel, *Vathek* (1782, trans. 1786).² Prior to the story’s actions, Vathek, who did not believe it “necessary to make a hell of this world to enjoy paradise in the next,” constructs five great palaces “destined for the gratification of each of the senses” (46). Unsatisfied with these monuments, he soon ordered the construction of a grand observatory, in imitation of the biblical tyrant Nimrod, “from the insolent curiosity of penetrating the secrets of heaven” (48). On first glance, these two versions of the orient appear starkly opposed to one another. Where Johnson approaches his modern oriental tale with the dispassionate logic of a mathematician, Beckford revels in the imagined excesses of the ancient east; and, where Rasselas and his companions stand in judgement of man’s insatiable drive to acquire and enjoy, Vathek strives only for worldly pleasure. Yet these stories share enough foundational similarities to make their differences seem superficial by comparison. Despite their exotic trappings, both tales are firmly grounded in eighteenth-century discourses regarding

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consumption and excess, and, in both cases, these discourses are themselves grounded in progressive ideologies of science and technology.

Rasselas’s survey of the pyramid would, no doubt, strike today’s tourist as eccentric, but it was “an accepted part of the early visitor’s sightseeing trip.” The nonchalance with which Johnson mentions this ritual—he allot it a mere half sentence—speaks to how closely the public associated the orient with empirical study. Similarly, *Vathek*’s palaces of the senses signify more than a greed for material pleasures. As Eugenia Zuroski Jenkins discusses in her book, *A Taste for China*, objects imbued with oriental aesthetics were tied directly to Lockean conceptions of the mind as a cabinet “that gradually fills with ideas derived directly from sensory information.”

Thus, Vathek’s desire to gratify each of his senses would have evoked notions of intellectual appetites, and readers would have recognized a functional kinship between his palaces and his impious observatory. Yet *Vathek* is no more a simple fable about the dangers of curiosity, than *Rasselas* is about the “tastelessness of pleasure.” Rather, both engage in sophisticated and, crucially, open-ended discussions about luxurious consumption and luxurious knowledge.

The eighteenth century was a pivotal time in the conceptual reformation of luxury. As Maxine Berg and Elizabeth Eger note, ancient associations between luxury and vice were giving way to modern associations between luxury and “production, trade and the civilising impact of superfluous commodities.” But luxury carried meaning beyond commodity consumption. Bernard Mandeville’s cynical *Fable of the Bees* gave much offence in its praise of self-interest, but it also gave an influential definition of luxury as “that [which] is not absolutely necessary to keep a Man alive.” This idea transitioned easily between superfluous commodities and superfluous knowledge. Thus Johnson’s *Dictionary of the English Language* defines luxury, in

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3 Kolb, *Rasselas*, 115n.


part, as the “Gratification of the mind or senses.” It is telling how few words set his definition apart from the description of Vathek’s hedonic palaces. If, as Nicholas Hudson asserts, Rasselas functions as a “defense of ‘luxury’ understood in the philosophical sense,” it is a cautious sort of defence. Almost perfectly equivocal in its treatment of England’s rapid growth as an economic and technical power, Rasselas, like Vathek, reflects a countervailing apprehension, shared by many, about England’s emerging luxury culture.

Their continued readability sets Rasselas and Vathek apart from most of the oriental tales that flooded eighteenth-century print markets: somnolent parables like The Adventures of a Friend of Truth: An Oriental History (1783); The Pupil of Adversity: An Oriental Tale (1788); or, Eastern Anecdotes of Exemplary Character. The definitive bibliography of The English Novel 1770-1829 lists over fifty oriental titles printed in just the last third of the century, a number which does not include the many more short stories appearing in magazines and other periodicals. Yet Rasselas and Vathek are quite typical of their genre’s preoccupation with economic and scientific modernity. If modern western science now seems incongruous with tales of the (usually ancient) east, it is because we have grown accustomed to regarding such tales as attempts at representing geo-political otherness. Rather, this chapter approaches the orient of eighteenth-century literature through the Bakhtinian lens of the “chronotope”, a symbolic marker of a text’s relationship to the social world. As will be discussed, the oriental chronotope simultaneously universalized science, and naturalized it within western history, but at the same time, deferred its unsettling implications to a remote, semi-mythological, space-time.


1. **The Orient in England’s Cultural Imagination**

What did the orient mean to eighteenth-century readers? This has been the pivotal question since scholars began to write seriously about oriental tales, and most have concluded, or simply assumed, that the orient represented primitivism and otherness. However, the close relationship between science and the orient complicates such conclusions in a manner that has yet to be satisfactorily addressed. The oriental tale’s more respectable, if slightly stodgy, cousin, the domestic novel, has enjoyed a much wider range of scholarly attention exploring its political implications, which has never lost sight of the novel as a medium of social and psychological reflection. Whereas the oriental tale is usually assumed to be a medium through which England came to know itself in the modern, colonial, economy, the domestic novel has been allowed to “represen[t] the history of the individual as well as the state.”

In some sense, this trend of approaching oriental fiction as an imperialist genre was a promotion from its previous obscurity. Though oriental tales enjoyed an impressive presence in the print market, their popularity did not guarantee due consideration as sophisticated literature. For most of twentieth century, oriental tales were regarded as frivolous, even semi-pornographic, curiosities, avowedly concerned with moral subjects, but “abound[ing] in lurid descriptions, often told with an only partially concealed leer.” They were finally granted significant critical attention with Edward Said’s ground-breaking book, *Orientalism*, which awarded them a dubious prominence within Europe’s campaign of “dominating, restructuring, and having authority over the Orient.” Said’s book kindled interest in literature that had, to this point, been largely neglected by academics. Yet much of the scholarship it inspired focussed narrowly on the genre’s colonial implications. Critics charged oriental tales with portraying the east as “destructive and diseased,” and rendering it “a background or foil against which to define the authorial self favorably.”

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default position for many was that these tales “made an object of the East and brought it palpably before the minds of literate people as object and as other,” promoting a “systemised ignorance” of eastern cultures.\(^\text{15}\)

In recent years, however, a new generation of scholarship has raised serious challenges to the anachronistic practice of reading nineteenth-century imperial paradigms into eighteenth-century oriental tales. As Roy Porter and G.S. Rousseau remind us, it was not yet a time of imperial conquest of the east, but rather “a moment of equilibrium” between eastern and western empires.\(^\text{16}\) Even beyond debunking backwards-looking myths about England’s colonial power, this generation has, on the whole, taken a decidedly more generous towards the literary orient than post-colonial theorists of the late twentieth century. Spearheading this new era of scholarship was Ros Ballaster, whose book *Fabulous Orients* and its companion anthology *Fables of the East* eschew the imperialist teleology of Said’s intellectual heirs. Ballaster does acknowledge that the exoticism of the imaginary orient made it easy for these tales to be co-opted into a nineteenth-century colonial discourse, and that, over time, oriental tales “increasingly came to be identified as a primitive model of government [to be] superseded by new forms of European colonialism.”\(^\text{17}\)

As she demonstrates, however, in an eighteenth-century context, oriental tales registered a desire for reciprocal material and cultural exchange, and the “narrative traffic between East and West in the eighteenth-century world is as lively, complex, and troublesome as the mercantile ventures that so dominated the period.”\(^\text{18}\)

A few years later, Srinivas Aravamudan emerged as another major revisionist scholar of the oriental tale. His book *Enlightenment Orientalism* rejects the notion that oriental fictions intended to naturalize ideas about eastern populations as indolent or perverse and thus in urgent need of cultural reform by way of an imposed European bureaucracy. Rather, he contends, “the itinerary of European


knowledge regarding the East [was] influenced by the utopian aspirations of Enlightenment more than materialist and political interest” (3). For Aravamudan, oriental tales were “transcultural, cosmopolitan, and Enlightenment-inflected.” Thus, he argues, rather than existing as a foil for western modernity, the orient was largely regarded as a partner in its Enlightenment project.

Revisionist scholarship of this sort has opened up the field for long overdue reinterpretations of a genre that rivaled the domestic novel in popularity. There remains, however, a marked tendency to emphasize the literary orient as a space of difference and otherness. Some scholars claim that particular regions served particular symbolic functions, while others claim that Europeans regarded the orient as a mainly undifferentiated other. Ballaster leads the former camp in claiming that regions expressed distinctive cultural characteristics. Ottoman narratives, for instance, are highly sexualized, and tend to address issues of despotism. Further east in Europe’s imaginative geography are fictions that “repeatedly trope India as a dream, but not always in the positive sense”; further still is China, which, Ballaster claims, is “a space of inauthenticity, or fictionality.” These demarcations are similar to those of Berg, who finds multiple orients expressed in England’s consumer goods. For instance, “Persian luxury […] was associated with excess, the sensual and seduction,” while China was associated with “ethics, harmony and virtue.”

Aravamudan, on the other hand, stresses the uniformity depicted in a wide range of “Oriental tales, pseudoethnographies, sexual fantasies, and political utopias.” According to him, the popularity of such literature resulted from an expanding awareness of, and enthusiasm for, a shared, global, cosmopolitanism. Oriental products, be they literary or material, seemed to unite England with all far-flung regions of the world. Zuroski Jenkins echoes this basic sentiment in noting how chinoiserie was fetishized, not for its association with a particular region, but because

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20 Ballaster, Fabulous Orients, 22-23.


22 Aravamudan, 4.
of its transcendent signification of “domestic elegance,” and “social exchange.” Of course, much scholarship falls between the poles of multiple orients, each with distinct symbolic meaning, or a universal, cosmopolitan orient. For instance, Chi-ming Yang demonstrates how different regions oscillated between universality and particularity. As she notes, major oriental empires, especially Egypt, Persia, and China, were largely interchangeable in the western imagination, and “these Asiatic empires formed part of an ‘Oriental’ lineage.” Still, she argues, the same empires could be held in opposition to each other, exemplifying different aspects of human nature. Yang finds a clear example of this uncoupling in Rasselas, when the titular prince unfavourably compares the pyramids of Egypt to the Great Wall of China, arguing that “whereas the latter can at least be used to defend the empire’s borders, the pyramids were built for no purpose other than an indulgence in despotic excess.” She might also have noted that the borders between orients immediately collapse when Pekuah is abducted in front of the pyramids by a band of marauding Arabs (120).

There is, of course, nothing incompatible with these universalizing or particularizing approaches to the orient. Indeed, even their proponents generally treat them as complimentary ways to elucidate significant aspects of the region. However, a common feature among them, which limits our understanding of the narrative mechanisms at play, is the strong emphasis on orient as a virtual contact zone between Europe and Asia. Eighteenth-century authors themselves were not bound by these geographical binaries. The literary orient was often less a physical space than an aesthetic inflection. Many authors used oriental tropes to adorn stories set in regions not often regarded as oriental in a geo-political sense. The most prominent of these is Rasselas, which remains quintessentially oriental, despite the fact that it is largely staged in a Christian region of Ethiopia. Beckford’s baroque poetical-essay, The Vision, presents an even more expansive conception of the orient, following its narrator on a reverie across the eastern orients of Africa,

23 Zuroski Jenkins, 77.


25 Yang, 186. See Johnson, Rasselas 117-119.
India, and the Middle East, as well as the western orients of the Americas. One large segment in particular depicts Catopaxia (Ecuador) as a manifestly oriental space, populated by “the genuine Descendants of those [biblical] Patriarchs” (42). An embodiment of the orient itself, the narrator’s companion Nouronihar is a figure of complete ethno-geographic indeterminacy. Her homeland at the earth’s core perforates every region of globe, and her body and manners are as diverse as the oriental populations with whom she communes. The narrator describes her pigmentation almost paradoxically as that of a “fair Indian,” while the author calls attention to the constant fluctuation of her eyes, which are “sometimes blue, then hazel, then emerald, then black, &c,” (Beckford’s note, 14). And it is with the same fluidity that she slips back and forth between the languages and customs of Persia and Catopaxia. Works such as *Rasselas* and *The Vision* demonstrate that the imaginary orient traversed and transcended geographical boundaries, and that it held a symbolic value that did not necessarily refer to the geopolitical world.

But if the orient did not refer to a fixed space then the question remains, what did the orient mean to eighteenth-century readers? Saree Makdisi’s book, *Making England Western* makes the strong claim that the orient designated an essential otherness, which traversed geographical boundaries. Citing writers, such as Walter Thornbury, Lord Shaftesbury, and Charles Dickens who regularly referred to London’s marginal populations as “city Arabs,” Makdisi argues that the concept of the orient was, at its core, a marker of difference, which was as readily applied to intra-national distinction as it was to international. Moreover, he notes, class relations, particularly in metropolitan centres, were frequently conceived in terms of different cultures or races. Oriental tropes often demarcated social boundaries, and were frequently applied to people “whose occupations, such as they were, did not map onto modern class structures.” This phenomenon, incidentally, might partially explain why the burlesque scientist, who straddled the increasingly blurry line between the middling sort and the gentry, was so regularly inflected with oriental markers. While Makdisi can be commended for excavating a forgotten orient in the English


28 Makdisi, 6.
imagination, and for expanding our understanding of the term, he cleaves to the basic notion of oriental fictions as tools of British imperialism. In an updated version of Saidian theory, Makdisi continues to argue that orientalization was a form of cultural erasure. Whether it be English or Egyptian, he asserts, the oriental label marked a population as intrinsically inferior, and thus fit for “ethnic cleansing.”

While there can be no doubt that the orient was regularly invoked as a marker of difference, this notion of essential otherness does not provide a full account of the orient’s symbolic function. The mimetic aspects of oriental tales encourage us to approach them as attempts to represent some inscrutable other, and they make it easy to overlook the fact that they were written towards a European audience, often trafficking in distinctly European subject matter. The presence of modern science and technology reminds us that, for all their interest in exotic cultures, these tales are no less concerned with practical aspects of the cultures that produced them. Thus, while acknowledging the obvious and important global nature of the oriental tale, this chapter focuses on aspects of oriental tales that are most concerned with European modernity. Not only does this slight change in emphasis better explain why authors like Johnson and Beckford considered their orients an appropriate place to insert science, it sheds additional light on eighteenth-century attitudes towards science and modernity more generally.

This emphasis on the orient as a space of domestic scrutiny is not unprecedented. Ballaster approaches the oriental tale as a sub-category of the fable, which, she observes, is “the place where not only two spaces meet (western print culture renarrates the oral fables of the East) but also two temporalities: the ancient and the modern.” For her, then, it is a kind of hybrid fiction through which the west scrutinizes itself alongside the east, by way of ancient, exotic, tropes. Aravamudan echoes this sentiment even more forcefully, declaring the stories of the *Mille et une nuits*—and by implication, the genre it inspired—to be “transnational and fabulistic” narratives,

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29 Makdisi, 84.

30 Ballaster, 7.
“written to the specifications of the folktale but with the aims of modernity in mind.\textsuperscript{31} Scholars have recently begun to explore this geographical-temporal fluidity with reference to Mikhail Bakhtin’s chronotope, a narrative structure in which time and space perpetually collapse and expand. As Bakhtin conceives it, the chronotope “(literally, ‘time space’)” is “the intrinsic connectedness of temporal and spatial relationships that are artistically expressed in literature.”\textsuperscript{32} It is the narrative element that assimilates the time-space of a story, and makes it responsive to the movement of history.\textsuperscript{33} No doubt the most famous chronotopic marker in western literature is the fairy tale mainstay, “once upon a time.” This simple phrase performs the complex function of demarcating a spatial-temporal distance between reader and tale, while simultaneously universalizing the experience, and drawing its message back to the lived world.

Ballaster was the first to apply Bakhtin’s structure to the oriental tale claiming that the “whole Orient is telescoped into the confined chronotope of the harem,” and this chronotope reveals more about “the geography of European desire than the space it depicts.”\textsuperscript{34} Aravamudan makes the nearly identical claim that “the space of the harem suggests the alternate temporality of the mythical Islamic East,” confusing “desire and epistemology in chronotopic motifs.”\textsuperscript{35} But have we any more reason to set the boundaries of the oriental chronotope at the curtain of Scheherazade’s bedchamber than to set the boundaries of the fairy tale chronotope at the threshold of a gingerbread house? The time-space of the eighteenth-century orient reached far beyond the intimate recesses of the harem, and it expressed far more than its readers’ libidinal desires. Thus, the oriental chronotope is only fully understood when it is granted all the symbolic and ideological capaciousness of the orient in its entirety.


\textsuperscript{32} Bakhtin, 84.

\textsuperscript{33} Bakhtin, 84.

\textsuperscript{34} Ballaster, \textit{Fabulous Orients}, 12.

\textsuperscript{35} Aravamudan, “Adventure Chronotope,” 246.
Expanding our conception of the oriental chronotope in this manner opens vast interpretive possibilities for the orient in the European cultural imagination. On the question of western science in fictions of the ancient east, the orient-as-chronotope offers two distinct but compatible solutions. First, that seventeenth- and eighteenth-century science had always been inflected with characteristics of, what Ballaster calls, the fabulous orient. Throughout the literature and art of the period, scientists are regularly depicted alongside icons of the mythical orient. These icons suggest the scientists’ drive to master the empirical facts of nature threatens to bring about the kinds of otherworldly retribution visited so often upon ambitious men in myths and legends. At the same time, the Royal Society attempted to harness the oriental chronotope in order to construct an epistemological lineage, and thereby universalize their teleological project. The second solution that the oriental chronotope provides is an avenue around proleptic assumptions that authors rendered the east primitive in the western imagination in order to facilitate nineteenth-century projects of “civilizing” through colonization. The orient of Rasselas, Vathek, and other such tales, is, equal to, and, in many ways, ahead of England in terms of commerce and technology, despite the fact that these eastern cultures are generally depicted as pre-industrial. This paradox is solved, however, when we recognize that the oriental time-space of eighteenth-century literature is as near to present-day science fiction, as it is to ancient fables and romances.

2. Chronotopes and Crocodiles

The chronotope is roughly analogous to “genre” or “setting”, but Bakhtin coined the term in order to emphasize how different genres and settings facilitate different expressions of the political world from which the work emerged. One such example is “the road.” Associated with random encounters, the road is where “the spatial and temporal paths of the most varied people—representatives of all social classes, estates, religions, nationalities, ages—intersect at one spatial and temporal point.”36 While he discusses his examples individually, he notes that, like motifs, multiple chronotopic elements may be present in a single work. We do not have to exert ourselves to come up with instances of this phenomenon. A story like Little Red Riding Hood, for example, plays out in the “hyperbolic” world of the fairy tale, and on the egalitarian space of the

36 Bakhtin, 243.
The story thus carries with it the narratological implications of both chronotopes. Even a small cue can draw certain chronotopic associations into a work that might be oriented towards some other purpose. “Once upon a time,” for instance, evokes the universal properties of a fairy tale, making it a surprisingly versatile chronotope, applicable to everything from achievements in the European Court of Justice to economic analyses of private sector management. In a similar manner, visual depictions of scientists in the eighteenth century employed various cues to inflect their subjects with qualities of the oriental time space. These included vaguely Asiatic beards, robes, and turbans, as in Isaac Taylor’s late century illustration of an astronomer and his assistant (Figure 3). But more frequently, the scientist is orientalised through the exotic artifacts in cluttered laboratories, the most prevalent of these being the iconic crocodile hanging from the ceiling above the experimenter. Typical examples of the crocodile in the laboratory, from across the century, include Elisha Kirkall’s etching, Dr. Sylvester Partridge’s Predictions (1719, Figure 4); William Hogarth’s illustration, Hudibras Beats Sidrophel (1725, Figure 5); and, Thomas Bewick’s untitled engraving of a bearded philosopher (1779, Figure 6). The association between scientist and crocodile was so strong that the reptile alone was enough to mark a figure as a virtuoso, as in Isaac Cruikshank’s etching, A Virtuoso and a Fly (1796, Figure 7).

The ubiquitous crocodile in the laboratory gestured in part to curiosities displayed by virtuoso collectors, but the crocodile simultaneously invoked a much older emblematic tradition. As Al Coppola notes, taxidermal crocodiles were prized amongst collectors, and “all but mandatory for natural histories, museums, and cabinets of curiosity.” Naturalists upheld crocodiles as the greatest of natural wonders, and even the disciplined virtuosi of the Royal Society appealed to the creature’s rich symbolic value, which awed spectators as “a true monstrosity [and], a

37 Bakhtin addresses the fairy tale chronotope by way of the “chivalric romance,” 154-155.
demonstration of God’s power to make wonders.” As a visual and literary icon, however, the crocodile’s significance is far denser, and more opaque than simple monstrosity. It nearly goes without saying that the crocodile was one of the foremost emblems of the orient. It was closely, though not exclusively, associated with the Nile, and it embodied all the wondrous worldliness and otherworldliness of the oriental chronotope. More particularly, the crocodile embodied dangers of the orient’s secret knowledge, as illustrated in the anonymous print, *An Emblem of Asia* (c1800), in which a scholarly woman stands in the foreground holding a book to her breast, while, in the background, a crocodile pursues its victim into the Nile (Figure 8). Associations with sinister knowledge, which is to say worldly and often empirical knowledge, had been prominent since the early modern period, long predating eighteenth-century curiosity cabinets and museums. The sinister element of this knowledge, however, did not equate to forbidden knowledge, and the crocodile should not be understood as a satanic figure. It was far more ambiguous than that.

The frontispiece of Gioseffo Petrucci’s *Prodomo apologetico* (Figure 7, 1677)—a tribute to his former teacher, the polymath, Athanasius Kircher—perfectly captures the crocodile’s ambiguity. In the image, an angel bestows a ribbon of paper from on high, upon which are written instructions for music, mathematics, and alchemy, and which a scholar dutifully records in the textbooks that surround him. Counterbalancing the divine implications of this knowledge, however, is the glowering crocodile upon which the scholar sits, suggesting a dangerous, worldly, quality to his texts (Figure 9). Notions of the crocodile’s special knowledge of the world date back to classical beliefs that the creature possessed a preternatural ability to foresee meteorological and other natural phenomena. It was believed that Egyptian sages could predict the flow of the Nile by observing the wondrous creature. Geffrey Whitney recounts this belief in his poem, “Providentia”, collected in book, *Choice of Emblemes* (1586):

> But leauing theise, which almost all doe knowe,

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41 Coppola, 72.


The Crocodile by whome th’Ægyptians watche,

How farre that yeare shall mightie Nilus flowe,

For theire shee likes to laie her egges, and hatche,

Such skille deuine, and science to fortelle,

Hath Nature lente vnto this Serpent fell.44

This short excerpt says much about the ambivalence of the crocodile as a scientific icon. As with Petrucci’s frontispiece, Whitney’s crocodile is imbued with sacred knowledge. However, he reminds us, this “skille deuine” is the science of a “Serpent fell,” whose knowledge, is of an equally sinister nature.

In addition to being a figure of sinister knowledge, the crocodile was also a figure of retribution and just deserts. Whitney’s emblematic poem, “Sobriè Potandum,” for instance, tells of a dog lapping at the banks of the Nile, wary that nearby, “a crocodile was ready in the flood.”45 In this analogy, the Nile represents wine, and the crocodile the poisoning element of alcohol. The poem thus urges caution and moderation in consuming intoxicating liquids.46 Eighteenth-century authors carried this moderating quality forward into their oriental tales, as in Johnson’s tale of Hamet and Raschid (Rambler 38, July 1750), wherein a crocodile metes out an ironic punishment to a man who attempts to exert too much dominion over nature. When a genii grants a single wish to each of the story’s titular characters—two drought-plagued farmers—Hamet asks for a moderate amount of water, and his crops are nourished by the rain. Raschide asks for an immoderate amount of water, and the genii redirects the Ganges through Raschide’s land so


45 Whitney, 125: 2.

46 Whitney, 125:4.
that “His plantations were torn up [and] his flocks over-whelmed.”

As his final punishment, a crocodile emerges from the river to devour him. Thus, as an emblem of both knowledge and punishment, the looming crocodile implies an element of danger for incautious virtuosi who do not moderate their pursuit of nature’s secrets.

But where artists and critics invoked the oriental chronotope to signify the potential dangers of empirical knowledge, the Royal Society attempted to harness the orient as a means of legitimizing their methodology and ideology of innovation. The Society’s enthusiasm for oriental history and artifacts stemmed in part from a genealogy of knowledge, which had taken hold during the Renaissance period. It was widely believed that the orient, especially Egypt, was where humanity enjoyed its first Golden Age of science. The Society appealed to this tradition in an attempt to establish an epistemic lineage, which would inoculate them against satirical charges that their scientific project was novel and therefore frivolous; and, perhaps more importantly, it would head off more serious allegations, such as those levelled by Margaret Cavendish, that science was a kind of epistemic revolution against traditional structures of knowledge.

Thus, in his *History of the Royal Society* (1667), Thomas Sprat credits the ancient orient with humanity’s first major advances in empirical knowledge, attributing “the original of Astronomy, Geometry, Government, and many Sorts of Manufactures, which we now enjoy, to the Assyrians, Chaldeans, and Egyptians.” By so doing, he figures the orient as an Edenic space, which once held the keys to retrieving a prelapsarian understanding of the created world.

The Society’s project to retrieve this ancient knowledge dovetailed with Robert Hooke’s project to correct our fallen senses and reclaim our divine knowledge of the world by way of artificial glasses. Sprat’s *History* employs much the same rhetoric as Hooke’s *Micrographia*, and is organized around a similar narrative of fall and redemption. Thus, while his orient is a site of

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48 See Chapter 1 for a discussion of Margaret Cavendish’s royalist political opposition to the Royal Society and Robert Hooke’s *Micrographia* in particular.

unfettered knowledge, it is also the site from which “proceeded the first Corruption of Knowledge.” As he recounts, the ancient mystics of the east hoarded their knowledge, wrapping their secrets “in the dark Shadows of Hieroglyphics,” and concealing them “as sacred Mysteries, for the Apprehensions of the Vulgar.” As this encoded knowledge travelled west over time, it continued to degrade, first through the imperfect translation of Greek and Roman philosophers, and then through the conquering Church, which invested its energies into more aggressive modes of “Disputative Philosophy,” neglecting what it perceived as “the tedious tryal of Experiments.” Sprat’s attempt to legitimize modern science by appealing to the oriental chronotope met with the same tepid success of other propaganda attempts. The supposed lineage between oriental mystics and modern scientists gained little purchase in the public imagination, and the Society’s efforts to mythologize itself by way of the orient mainly succeeded in providing a set of ready-made tropes for satirists and other detractors. Sprat’s History did, however, offer a somewhat credible, real-world complement to mythological symbols like the crocodile, and, by so doing, helped naturalize science in literary depictions of the ancient east.

3. Western Science in Eastern Tales

Those for whom the orient represents a space of stark otherness may be surprised by how comfortably modern science slipped into fables of the remote east. Often, the science in oriental tales is encoded to match the aesthetics of its setting, and authors invoke modern disciplines by way of their ancestral branches. A typical example is found in the anonymous “History of Abdalzar” (1776), which follows an Arabian philosopher, who “had been by his father, who was a physician […] instructed in astronomy, astrology, physic and other branches of learning.” In other cases the science is unapologetically modern, as with Voltaire’s titular Babylonian scholar, Zadig (c1775), who, recalling Thomas Sprat’s History, “was well instructed in the sciences of the

50 Sprat, 5.

51 Sprat, 5.

52 Sprat, 12.

antient Chaldeans, and was not ignorant of the principles of natural philosophy which were then known.”

Voltaire’s modern understanding of nature—“quite opposite to the new philosophy of his time”—occasions ironic amusement at the expense of the senior Magi who “told him with an insulting air, that he maintained wrong sentiments, and that he was an enemy to the state for thinking that the sun should turn round its own axis, and that the year consisted of twelve months.” Yet another example of the scientific orient is found in *The Visiers* (1774) wherein immortal youths “whom the Persian writers have taken for so many genii” entertain wandering princes with ostentations displays of “all those wonders of nature, those secrets, arts, and science, which the indefatigable industry of mankind has successfully discovered.”

In a manner deliberately recalling the showmanship of the early Royal Society, the elfin children amuse the princes with displays of the most modern scientific fascinations, “exhibit[ing] “marvellous effects of electricity, and the bright scintillations of the now destructive nitre.” Electrical experiments, like those of Benjamin Franklin and John Freke, represented the vanguard of knowledge in the latter half of the eighteenth century, as did that “destructive nitre,” otherwise known as “phosphorus”. Although phosphorus had been discovered over a century before, it remained an icon of scientific modernity into the nineteenth century as evidenced by two pivotal scenes of scientific spectacle in Maria Edgeworth’s domestic novel, *Belinda* (1801).

Curiously, however, such displays seem more at home in ancient tales like *The Visiers*, than in modern novels like *Belinda*, and appear with much greater frequency.

In at least one case, the presumed clash between eastern primitivism and western modernity became a tool for satirizing the same Euro-centric presumptions of which post-colonial scholarship so often accuses oriental tales. Elizabeth Inchbald’s short farce *The Mogul Tale*

54 Voltaire. *Zadig; or, the Book of Fate: An Oriental History* (London, c1775), 3.

55 Voltaire, 4.


57 Pillement, 31.

(1784, pub. 1788) pokes fun at self-important Europeans who presume their culture so advanced as to be nearly incomprehensible to the supposedly backwards people of the orient.\textsuperscript{59} The plot centres on a virtuoso-balloonist and his two passengers—the philandering cobbler Johnny and his simpleminded wife Fanny—who are blown off course and crash into the garden of an Indian mogul. Mistaking the modern nation for something out of an oriental romance, the virtuoso Doctor fears that he and his passengers be mistaken for “three witches that ride in the air,” and executed by superstitious Indians.\textsuperscript{60} However, the mogul is a literate man who keeps up abreast of the latest scientific productions through international newspapers, though he mainly views these productions as amusing distractions. Recognizing the airship for what it is, he entertains himself and his subjects, and Inchbald’s audience by feigning ignorance and staging a mock trial for his terrified guests. \textit{The Mogul Tale} appeared amid a cluster of works capitalizing on the hot-air balloon craze, which began in November 1783 with the Montgolfier brothers’ spectacular ascent over Paris. The tale’s overt topicality renders it something of an outlier among oriental tales, few of which transpire on a contemporary timeline. But it sits in good company next to \textit{Rasselas}, another modern oriental tale likewise concerned with technological innovations including manned air travel.

3.1. \textit{Rasselas} and the Inevitability of Progress

\textit{Rasselas} handles science with an air of scepticism, despite the fact that Johnson was himself an enthusiastic dabbler. James Boswell’s \textit{Life of Samuel Johnson} (1791) refers on several occasions to Johnson’s scientific curiosity, noting that he always “seemed pleased to talk of natural philosophy.”\textsuperscript{61} As meticulous notes in Johnson’s diaries and letters attest, the empiricist’s project of observing and collecting appealed to his fastidious nature. He habitually recorded data on all manner of phenomena from the number of steps taken in an outing, to the weight of leaves, to the

\textsuperscript{59} Elizabeth Inchbald, \textit{The Mogul Tale; or, The Descent of the Balloon} (London: 1788).

\textsuperscript{60} Inchbald, 3.

growth rate of his fingernails. As one scholar puts it, “he liked, in short, to count.” Science is a regular feature of Johnson’s periodical writing, and even satirical moments are generally handled with fondness and good humour. Perhaps the most famous of these, published in the Rambler 199 (February 1752), and plagiarized at least once, recounts the farcical injuries of a virtuoso who confesses, “I have fallen eleven times speechless under the shock of electricity; I have twice dislocated my limbs, and once fractured my skull in essaying to fly; and four times endangered my life by submitting to the transfusion of blood.” Johnson would return to the penultimate injury in an episode of Rasselas, though in a much gloomier tone. The story’s sixth chapter, “A dissertation on the art of flying,” assumes a cynical attitude towards scientific projectors, implying both that their ambitions exceed their capabilities, and warning of the destruction that might result were this not the case. This attitude resounds in another significant, if somewhat more oblique, examination of modern engineering—discussed at length below—wherein a hermetic astronomer tells of a strange conviction that he can, by the force of his will, manipulate the waters of the Nile. These supposed powers appear, at first, to be the delusions of a melancholic recluse. But upon closer examination, his account bears a striking resemblance to discourses around the massive irrigation and transportation projects of England’s canal boom, which was accelerating at around the time of Rasselas. These episodes, which nearly bookend the story, imply a clear lack of optimism about England’s technological modernity. But, typical of Johnson’s equivocal style, both episodes refuse to take a definitive stance on the issue, leaving it to the reader to judge whether the risks of modern technology outweigh the benefits.

The would-be flying man of Rasselas’s “dissertation” is not wholly the project of Johnson’s imagination, but is rather an anthropomorphic composite of existing proposals for manned flight.


Johnson draws heavily upon John Wilkins’s *Mathematical Magick* (1648) for his artist’s philosophies and inventions, with the artist’s “sailing chariot” modeled upon a machine that Wilkins proposes in the second section of his book, entitled *Dædalus*. The chapter culminates in an implicit affront to Wilkins and like-minded projectors, when the artist is unable to achieve mechanical flight like the mythical Dædalus but instead crashes into the water like the inventor’s prideful son. On its surface, the episode appears to offer the (by this point well-trodden) moral that mechanical science is dangerous because it operates contrary to nature’s dictates. Schemes such as man-made flight, the chapter seems to say, are doomed to fail, because they ignore the basic fact of man’s place in the created world. Prince Rasselas raises a number of arguments against the artist’s proposed flying machine, essentially reiterating the assertion that “every animal has his element assigned him; the birds have air, and man and beasts the earth” (24). And the aviator’s disregard for these concerns seems to add a dash of poetic justice for the amusement of a reader who can easily predict the artist’s unhappy fate. Yet the apparent lesson that scientific over-reachers deserve what they get, obscures the episode’s place in a series of discussions regarding the ethics and practicality of scientific, and technological, innovation.

Twentieth-century scholarship is especially prone to approaching the episode as an indictment of all branches of mechanical science and claiming that Johnson’s intended message is that the only valid branch of philosophy is moral philosophy. Louis Landa reads the mechanic’s ill-fated experiment as “an affirmation, negatively arrived at, that man, not nature, is the proper study of mankind.” Such assertions continue to reverberate among scholars who maintain, for instance, that “Johnson considered moral education to take priority over scientific knowledge.” As Thomas Keymer notes, however, the episode itself defies such straightforward conclusions, as the contraption that endangers the aviator’s life subsequently “sustain[s] him in the


water” (28). Yet even without this perpetually overlooked detail, any final conclusion on the utility of technological progress should strike us as out of sync with a tale otherwise structured on a pattern of proposition-refutation and that concludes on a chapter that declares “nothing is concluded” (74). Allegations such as Landa’s simplify the chapter’s complex engagement with new technologies and man’s ethical relation to them.

One obvious reading is that the episode warns against new technologies, which might easily be turned towards conquest. The artist himself voices such concerns when he asks, “what would be the security of the good, if the bad could at pleasure invade them from the sky?” (28). And, while the mechanic’s crash interrupts the tale’s musings on militarizing technology, Rasselas soon revisits this theme. A few chapters after the “dissertation”, the prince and his mentor Imlac discuss European colonialism. “By what means,” asks Rasselas, can Europeans “so easily visit Asia and Africa for trade or conquest, cannot the Asiatics and Africans invade their coasts, plant colonies in their ports, and give laws to their natural princes?” (47). To this Imlac dolefully replies, “because knowledge will always predominate over ignorance […] But why their knowledge is more than ours, I know not what reason can be given, but the unsearchable will of the Supreme Being” (73). This bleak sense of inevitability flies in the face (so to speak) of any claim that Johnson doubted technology would continue to progress. Moreover, Imlac’s prescient assurance that Europe would continue to dominate cultures with less advanced technologies is perhaps the closest that the story comes to voicing Johnson’s own opinion on the topic, or at least that which resonated most with him in later life. Recounting a carriage ride in 1781, which neatly juxtaposes Johnson’s continued interest in science with his apprehensions about its consequences, Boswell writes that Johnson talked little “being chiefly occupied in reading Dr. Watson’s second volume of ‘Chemical Essays,’ which he liked very well, and his own ‘Prince of Abyssinia,’ on which he seemed to be intensely fixed.”


about the technological basis of Europe’s colonial dominance, Johnson opined, “This, Sir, no man can explain otherwise.”

These discussions of military technology are the story’s most dramatic meditations on the shadow side of scientific progress, but the companion episodes, involving the apparently mad astronomer, explore issues that are more immediate to Johnson’s life, and the lives of his readers. And Rasselas leaves these latter episodes similarly open-ended. In terms of modern disciplinary divisions, the mechanic can be seen to embody the applied sciences while the astronomer can be seen to embody the theoretical. And, just as the “dissertation” has been read as a caution against excessive scientific ambition, the ostensibly mad astronomer has been read as a caution against inert analytical speculation. This disciplinary division is consistent with Johnson’s own conception of astronomy, which he defines as “a mixed mathematical science,” likening, by way of Abraham Cowley, to “the understanding of the globes and the principles of geometry.”

Where the former discipline offers new possibilities for destructive technologies, Johnson seems to argue, the latter can become maddeningly solipsistic. The astronomer’s belief in his power over the weather has generally been regarded as figure of irrationality and/or mental illness. In her influential article Kathleen Grange writes that, “with the psychotic’s characteristic confidence in his own obsession and typical dislike of rational argument about his favourite subject, the scientist refused to explain his technique or elaborate his theory to the sceptical Imlac.” Yet the astronomer is not in the least averse to rational argument. His account of his powers suggests that his apparent madness is born not of a lack but rather an excess of scientific rationality and too great a focus on his theoretical speculations.

70 Boswell, 119.

71 Samuel Johnson, Dictionary of the English Language (London: 1755).


73 Grange, 162.
But we should not assume that Johnson intends to denounce a life devoted to theoretical study. The episode has been read as “a charming Newtonian parable of unriddling the heavens pursued to the point of pathology,” but this conclusion is somewhat eager to find the astronomer ill, and it downplays the ambiguity of his apparent madness. Significantly, it ignores the dignity which Johnson affords his scholar, who deliberates lucidly over the potential consequences of his powers. The astronomer does not sound in the least pathological when he explains the balance with which he “made to the different nations of earth an impartial dividend of rain and sunshine” (145). More importantly, those who claim that the astronomer is mad are approaching him as they would a character from a Victorian novel, assuming subjective interiority. As is conventional of oriental tales, Rasselas operates in a register more overtly metaphorical than other modes of fiction. Generic expectations would have encouraged readers to approach characters, at least in part, as exemplars or symbolic markers. In this case, the astronomer’s elemental powers, though fantastical, allude to contemporary issues of agriculture and engineering.

In a deliberate, if circuitous, way, the astronomer episodes engage with topical, real-world, concerns related to England’s massive canal projects. As Wendy Laura Belcher observes, the astronomer channels Ethiopian discourses regarding the mechanical regulation of the Nile, as well as European debates over whether such a thing were possible. Belcher notes that all of the astronomer’s supposed abilities relate to the Nile, and particularly how it might be harnessed for irrigation. As she writes, “the first mental act of his delusion is commanding the clouds to ‘send rain on the southern [i.e., Ethiopian] highland mountains, and raise the Nile to an inundation’ (146). He controls ‘the dog-star’ and ‘the crab’ (145), both of which stars were seen in the ancient world as essential to the flooding of the Nile” (brackets and parentheses in the original). She concludes that “the astronomer’s delusion about controlling Egyptian fecundity emerges from the Habesha [Abyssinian] claim to control that very thing” (brackets in the

74 Michale, 45.

original).\textsuperscript{76} It is entirely reasonable to suppose that Johnson would have intended these associations. The Habesha’s ability to regulate the Nile was a subject of serious consideration in Europe during Johnson’s lifetime. Its plausibility was discussed in all major texts regarding Abyssinia, including Johnson’s translation of Joachim Le Grand’s \textit{A Voyage to Abyssinia} (1735), a manuscript account of Jesuit missionary Jerónimo Lobo’s seventeenth-century travels.\textsuperscript{77} According to the \textit{Voyage}, the kings of Abyssinia “are still persuaded that the keys of the Nile are in their hands, and that they can, when they please, change its course” (180). This passage does not refer to a superstitious delusion, as has been attributed to the astronomer, but of the ability to dig a canal through the Abyssinian mountains, though Le Grand concludes the Abyssinians lacked the engineering capabilities for such a project (180).

Belcher makes a strong case that Johnson wrote his astronomer with Habeshan engineering somewhere in his mind, but she does not press the question as to why he chose to revisit these particular enterprises in his 1759 tale. In fairness, her study seeks only to prove that these discourses migrated into western consciousness by way of \textit{Rasselas}; however, there is more to say about the topicality of the issue. Johnson’s oriental mystic symbolically enacts feats of engineering that were becoming a matter of real significance in England, the massive expansion of irrigation and trade canals. Such an association would not be a stretch for Johnson’s readers at the beginning of the canal age (c1760-1840), during which time over 4,000 miles of pilottable rivers and canals stitched England together as a single commercial body.\textsuperscript{78} This unprecedented infrastructure project, or, rather, amalgamation of numerous discrete projects, required enormous promotional efforts by government and private industry. Renowned engineer, James Brindley, or perhaps a company ghostwriter, describes the Bridgewater Canal project (1761-1762) with a

\textsuperscript{76} Laura Belcher, 217.
propagandist’s flourish. His *History of Inland Navigation* (1766) declares that in the canal, “grandeur, elegance, and economy are happily united,” and proclaims that it will stand for ages as a “monument to good taste, public spirit, and economy.” More ambitiously, he envisions canals as avenues to global unity, asserting that inland navigation “joins the whole world in a social intercourse of benefits.” John Phillips, canal historian, and former employee of Brindley, repeats this pre-packaged claim, without alteration or acknowledgement, in his *Treatise on Inland Navigation* (1785).

Yet not all references to England’s expanding waterways were quite so enthusiastic. Literature of this period registers quiet, but pervasive, anxieties about the social disruptions that might result from the proliferation of canals. Tellingly, these marvels of commerce and engineering are choked with the bodies of rural waifs and lovelorn maidens in maudlin stories like *The Rural Christian* (1772), and, *Elfrida; or, Paternal Ambition* (1786). Markman Ellis’s book *The Politics of Sensibility* examines the uneasiness with which many people met the canal boom, and how late century literature, particularly sentimental novels, negotiated abrupt transformations in “aristocratic virtue and commercial wealth.” As he discusses, the general sense of optimism surrounding the nation’s new commercial arteries was balanced by concerns of how an influx of metropolitan luxuries would impact idyllic rural communities, and, conversely, how a lack of access to these arteries would abandon other communities to the economic wilderness. Ellis concludes that sentimental novels played a key role in assuaging anxieties about the new

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81 Brindley, 1.


83 George Wright, *The Rural Christian; or, the Pleasures of Religion* (London, 1772), 196; A Lady, *Elfrida; or, Paternal Ambition* (Dublin, 1786), 34;

commercial reality, by reframing the cold logic of capital circulation in terms of the more congenial logic of reciprocal sympathies.

Though his argument is persuasive, Ellis focuses narrowly on canals as emblems of economic modernity, declaring that “the canal revolution was truly commercial rather than technological.” Yet histories and other accounts regularly emphasize the industry and innovation required to construct canals. This is true in accounts of modern projects, like Ralph Dodd’s *Short Historical Account* of the greatest known canals (1795), which describes in detail the “ingenious method” of excavating and levelling the Bridgewater canal. But it is perhaps even truer of oriental histories, tales, and travelogues, wherein canals are foremost emblems of the ancient world’s “ingenious inventions [and] mechanic arts.” An anonymous *Collection of Voyages and Travels* (1732), for instance, underscores the “immense charge” and “wonderful industry” with which the ancient Chinese “cut a canal across several provinces.” And a historical account of canal navigation in Pennsylvania (1795) cites canals among the “first improvements made on the face of nature,” by Egyptian, Babylonian, and, especially, Chinese engineers. Canal projects were clearly bound in the public imagination to the progress of what Johnson refers to as the “useful arts,” which included various scientific and commercial innovations. However, Johnson’s feelings on the progress of these arts were ultimately conflicted.

Donald J. Greene and subsequent scholars have noted that Johnson was mainly positive about the commercial progress that canals were coming to represent, though, true to form, it is a highly

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85 Ellis, 142.
86 Ralph Dodd, *A Short Historical Account of the Greater Part of the Principle Canals in the Known World* (Newcastle, 1795), 20.
moderated enthusiasm. Johnson’s optimism was influenced by Adam Smith, who wrote that “good roads, canals, and navigable rivers, by diminishing the expense of carriage, put the remote parts of the country more nearly upon a level with those in the neighbourhood of the town.”\footnote{Donald J. Green, \textit{The Politics of Samuel Johnson} (New Haven: Yale University Press, 1960), 280-284; Adam Smith, \textit{The Wealth of Nations Books I-III}, ed. Andrew Skinner (New York: Penguin Books, 1999), 251.} Johnson himself once claimed that expanding luxury markets contributed to the wellbeing of all, since one “cannot spend money in luxury without doing good to the poor.”\footnote{James Boswell, \textit{Boswell’s Life of Johnson}, vol. 3, ed. George Brikbeck Hill (Oxford: Clarendon Press, 1934), 291.} However, the dour character of the astronomer hints at Johnson’s simultaneous discomfort with the massive engineering projects, which were literally changing the face of his nation. He voices this ambivalence in a 1771 letter to Hester Thrale, in which he describes the Staffordshire Canal as “one of the great efforts of human labour and human contrivance”; yet in the next moment he comments wistfully upon how strange it is that man should have the capability of “uniting waters that Nature had divided, and dividing lands which Nature had united.”\footnote{Samuel Johnson, \textit{The Letters of Samuel Johnson: Volume I, 1731-1772}, ed. Bruce Redford (Princeton: Princeton University Press, 1992), 366, 367.} It is with the same chiastic sensibility that Johnson tempered his optimism about the social benefits of luxury. Despite its moral benefit, he once complained, economic growth leads to a commensurate growth in corruption and greed, and that “the increase of commerce, and the incessant struggle for riches which commerce excites, gives us no prospect of an end speedily to be expected of artifice and fraud.”\footnote{Boswell, \textit{Life}, vol. 2, 199.} As with his astronomer, Johnson is unable to conceive an acceptable balance between beneficial and corrupting luxury.

\textit{Rasselas} is not the only tale to feature eastern canals as a cautioning analogy for western luxury. Beckford similarly abstracts the moral implication of England’s commercial transportation boom onto the not-quite-real world of the orient. Emri Taher Achmed, of Beckford’s \textit{History of the Princess Zulkaïs}, enlists various engineers to “carr[y] out his impious design of regulating the overflow of the [Nile].”\footnote{Beckford, \textit{Vathek and Episodes} 294.} Sadly, his project becomes a casualty of its own success when his
lands are devastated as the region is covered “with too luxuriant vegetation which left it afterwards exhausted” (294). Fears that over-productive plant life might prove harmful to agriculture, depleting soil or robbing crops of their nutrients, was a subject of concern among colonial plantations, such as those from which Beckford derived his fortune. Beckford’s cousin of the same name cautions Jamaican planters that “if the land upon which the canes are planted be too much invigorated, they will be too luxuriant to yield returns.” Yet Beckford, whose fiction notably refuses to engage with the colonial world, may rather intend the episode as a parable than a horticultural lesson. The dangerously fecund river of the story recalls Hugh Blair’s oft-quoted assertion “that the present constitution of human nature cannot bear uninterrupted prosperity, without being vitiated by it. The poisonous weeds which spring up in that too luxuriant soil, require the hand of adversity to keep them down.” Thus, like Johnson, Beckford uses the exaggerated possibilities afforded to oriental literature as a means to abstract and universalize an ethical matter that was becoming urgent in his own world, in this case, the analogy between prosperity and vice.

Johnson’s final assessment is not quite as pessimistic as Beckford’s, but neither is it entirely optimistic. Taken together the scientist episodes in Rasselas dramatize an argument Johnson made years earlier in the Adventurer no. 99 (October, 16, 1735), wherein he partially defends projectors against those who would thoughtlessly belittle them. As he writes:

Many that presume to laugh at projectors would consider a flight through the air in a winged chariot, and the movement of a mighty engine by the steam of water, as equally the dreams of mechanic lunacy; and would hear with equal negligence, of the union of the Thames and Severn by a canal, and the scheme of Albuquerque the viceroy of the Indies, while in the rage of hostility had contrived to make Egypt a barren desart by turning the Nile into the Red Sea.


98 Johnson, Idler, 434-35.
The tone of the article implies a justification of these determined engineers, yet conspicuously fails to relieve its tension with a “but….” Moreover, none of Johnson’s examples had yet proven their doubters wrong, nor would they for several decades at least: Watt built his steam engine in 1781; the Montgolfier brothers launched their balloon in 1783; parliament had been discussing a Thames-Severn canal since the 1730’s, but Johnson would not live to see it realized in 1789; and Albuquerque never managed to dig a canal from the Abyssinian mountains to the Nile. Rather than vindicating these visionary projects, the piece concludes with the consolatory observation that ambitious failures “may sometimes benefit the world even by their miscarriages” (435).

Beginning here and culminating in Rasselas, Johnson leaves his readers with a conflicted sense of such potentially world-changing advances in science. Whether these productions would ever be realized, and, if so, whether they should be considered a boon or a curse, is left open. What Johnson never questions is the inevitability that knowledge and technology would progress, and neither, for that matter, does Beckford.

3.2. Beckford’s Unresolved Dialectics on Science

Science quietly suffuses Beckford’s oriental writing, from his earliest literary forays in the genre-defying Transport of Pleasure and The Vision, continuing through Vathek and its Episodes.99 No significant work has yet been done on the pervasiveness of science in Beckford’s writing. Critics have instead focused on its wildly imaginative character, and the author’s alignment away from mundane matters of everyday life. On rare occasions, when the topic arises, scholars are more likely to regard Beckford as an emphatically anti-scientific figure who “draw[s] on the secreted and antiquated non-sciences of astrology and esotericism, as he oversees the construction of an unhallowed ‘fairy world.’”100 Yet this “fairy world” owes much of its character to scientific discourses to which Beckford was exposed as a student, and which remained topical amongst those in his English and continental circles. He does not set modern science in opposition to oriental mysticism, as tends to be asserted, but he rather interweaves


Newtonian and Boylean philosophy, and radical atmospheric and electrical theories, into his mystical worlds. As in *Rasselas*, the science of Beckford’s orient is entangled with concerns about luxury and consumption. Beckford highlights the baseness of European materiality against the backdrop of a romantic, nearly Edenic, orient. Yet his obvious fondness for material pleasures remains in constant tension with his escapist fantasy.

Beckford’s early schooling included a grounding in natural philosophy and natural theology, which find their way into his highly aestheticized writing. He received his primary education at his familial estates in Fonthill and Westminster under various tutors including the stringent Robert Drysdale and the fonder Alexander Cozens, the latter of whom impressed upon his pupil a fascination with eastern languages and texts. Beckford demonstrated a high aptitude for all areas of learning, including natural philosophy, which at times proved as stimulating to his romantic imagination as did Arabian tales. An extravagant letter to Cozens known as *The Transport of Pleasure* envisions a scene of scholastic bliss wherein the two cloister themselves in a tower and contemplate Francis Bacon’s scientific utopia, *New Atlantis* (1627), which Beckford declares “no less splendid than philosophical” (6). The letter implies a familiarity with the kind of pious naturalism advanced by Christian virtuosi, such as Robert Boyle, though it does so with an intimacy that would have probably caused the modest Boyle to blush. In one indicative passage Beckford entreats Cozens to “Think with what pleasure we shall return to our elevated apartments after conversing with Nature in the groves,” and imagine afterwards “having gained every hour some new insight into the great volume of the Universe we will ascend a winding path bordered by Larches and Acacias and perfumed with Thyme and Honeysuckle, that leads to the portals of our Tower, where we shall arrive just as the glow of the western sky blends with the soft hues of the rising Moon” (9). Similarly ornate allusions to tracts on the Noachian flood attest to a basic familiarity with eighteenth-century naturalism. Of these, Jean Jacque Scheuchzer’s treatise *Physic Sacrée ou Histoire-Naturelle de la Bible* (1732) earns the high compliment of being placed in the scholarly tradition of “the Pharoah’s Magicians” (20-21).

Beckford’s scientific tutelage intensified in his late teenage years and continued to spill into his fanciful writing. Fearing he might succumb to the depraved allures of university life, his mother sent the seventeen-year-old to Geneva to reside with his relatives Colonel and Mrs. Hamilton.
Beckford’s tutelage was overseen by the Reverend John Lettice who brought him to lectures and introduced him to naturalists like Charles Bonnet and the Chevalier d’Espinasse. While Beckford’s leanings were always more artistic than naturalistic, his oriental writings challenge traditional Newtonian physics with the acuity of an informed discontent. As Chatel Laurent demonstrates, for instance, *The Vision* and *Vathek* both draw upon “the latest discoveries in micro-biology, geology and electricity” to subvert conventional materialistic conceptions of light and colour. And, whereas Beckford treats Newtonian optics with a grudging familiarity, his writing of the 1770’s and 1780’s evince a fashionable enthusiasm for emerging fields of electromagnetism and atmospheric studies.

While conventional areas of naturalism and physics seem to have comprised a significant portion of his education, Beckford’s vivid imagination inclined him toward the more wondrous studies that existed in the umbra between mysticism and mainstream science. Michel Baridon demonstrates how sensational fields of electricity and electro-magnetism (as well as their pseudo-scientific applications) permeated Beckford’s intellectual circles. Baridon places Beckford within a community that nurtured experimenters such as Pieter van Muschenbroek and René Antoine Ferchault de Réaumur. Moreover, Baridon plausibly connects Beckford to less reputable figures in the field of applied galvanism, including Emma Lyons, one-time superintendent of London’s Aesculapian Temple for electromagnetic healing. Finally, Baridon suggests that electricity-discharging globes such as those described in Joseph Priestley’s *Introduction to the Study of Electricity* (1769), displays of which delighted Beckford’s fashionable peers in England and on the continent, likely inspired the strange flames and luminescent globes that astound Vathek and his companions (105, 140).

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104 Baridon, 86.
Unlike the fickle Vathek, however, Beckford was not merely amused by the novelty of these technological baubles. His literary works probe the numinous implications of avant-garde scientific theories regarding electricity and atmospheric studies. *The Vision* is preoccupied with the relationship between Europe’s avarice and the grossness of its atmosphere. The waking dreamer of Beckford’s fanciful essay is led through the centre of the world and beyond by the spirits Malich and Terminga. The angelic figures share occult knowledge about the physical properties of energy and air, revealing to him that the Æther “is composed of innumerable luminous particles, singly imperceptible, [from which] proceeds the serene, mild Light we enjoy” (30). The passage very closely resembles the kinds of ideas proffered by the likes of Priestley and Richard Lovett, whose extensive writings on the nature of electricity were the source of enthusiasm and controversy within the scientific community. While no specific scientist is named, Beckford’s particulate theory closely resembles that put forth in Lovett’s *Electrical Philosopher*, which posits that elemental fire “is in form an exceedingly fine Air or Æther, and is by means of Electricity discovered to exist in Pores of all gross Bodies.”105 In a manner reminiscent of *Paradise Lost*, Beckford sets the gentleness of spiritual fire and the fineness of Ætherial air in opposition to the harshness of their European correlates.

In its extensive engagement with various forms of air, *The Vision* assimilates Priestlean atmospheric theory into a Miltonic conception of fallen nature. The duality of the work’s energies and airs place Beckford in a tradition of late eighteenth-century authors who negotiated mystical and naturalistic conceptions of the atmosphere, rendering it visible as an object of knowledge and a feature of imagination. Jayne Elizabeth Lewis’s genealogy of literary atmosphere, *Air’s Appearance*, traces the eighteenth-century shift from a Boylean conception of a homogenous atmosphere, towards a Priestlean conception of heterogeneous atmospheres.106 *The Vision*, which draws heavily upon the physico-theology of *Paradise Lost*, operates mainly within a seventeenth-century model of air as a quantifiable object. As Lewis notes, the


106 Jayne Elizabeth Lewis, *Air’s Appearance: Literary Atmosphere in British Fiction, 1660-1794* (Chicago: University of Chicago Press, 2012). Here “Priestlean” is intended metonymically. It is probable that Beckford’s naturalistic education brought him into contact with Priestley’s work; however, as Lewis notes, Priestley came to represent a broad shift in conceiving a plurality of airs (196).
corpuscular air that Boyle theorised in the 1660’s takes literary form in Milton’s epic. When paradise is lost, so too is the “Transparent, elemental air” of Eden. The “wide transpicuous air” through which God once spoke to Adam degenerates into the “murky air” through which Satan gleefully “snuffed the smell [of] mortal change of earth.” The Vision stages the same phenomenological transformation in reverse when the speaker’s initiation into the spiritual realm clears the “murky air” that fogs his senses (25). Cleansed by the spirits’ silver light, he immediately experiences a “delicious Odour”—an apparent analogue to the “delicious air” that characterizes Heaven in Paradise Lost—and his senses are restored to a state of perfection his mortal body had never experienced (29). As the spiritual journey reveals, however, the earth’s air does not thicken everywhere. The vast orient, which is to say, all that is not Europe, remains pure and unfallen.

The density of the earth’s “factitious airs,” to borrow one of Priestley’s expressions, reveals the moral quality of the people of the regions. Specifically, The Vision portrays greed as what we might now regard as a type of air pollution, though a kind with unexpected benefits. Upon discovering the expansive caverns beneath the earth, the speaker is struck by the copiousness of precious metals and the befouling airs they produce. As he relates, “down horrible chasms flowed a fiery stream of molten gold silver and other minerals indiscriminately mingled with ore and lava which sent forth black vapours that tinged the roof and the pavement with an infernal hue” (24-25). Like Adam and Eve before the fall, the inhabitants of the earth’s subterranean wilds are, as Malich describes them, “a pure simple Race unsullied by Fraud or Rapine, Unconscious of the love of Gold [or] Jewels” (32). This sinless race is untainted “by the gross and foul particles” born of Europeans’ “avaritious thirst of riches the malignity and the ferocity of those Nations” (32, 12). Thus, they, along with various orientalised populations that the

109 Milton, 2.400.
speaker observes in Africa and South America, are able to survive in an air so refined that “those of Europe are almost incapable of breathing” (41).

Yet Beckford negates this utopian purity with his covetous attention to the very riches that he disavows. These oriental lands are desirable precisely because of the material wealth they offer, with their “golden alters,” “golden instruments,” and “clusters of gems and minerals” (36, 37, 50). Ultimately, The Vision fails as an argument for spiritual simplicity since Europe’s thick air offers unique possibilities for pleasure. The vast mineral resources of these unpolluted regions remain as invisible to the inhabitants as the Æther. This ambivalent attitude towards material culture continues throughout Beckford’s oriental tales, Vathek in particular. In contrast to the dispassionate equivocation of Johnson’s philosophical orient, Beckford luxuriates in the sensual possibilities offered by the region. However, there is an odd kinship between the authors in so much as neither delivers the final critique he seems to promise.

Beyond their exotic locales, Beckford’s sensual oriental visions seem to share little with Johnson’s sober dialogues on happiness and human nature. Yet they are remarkably similar in their coded discourses on scientific modernity. As Simon During notes, Vathek and Rasselas are generic cousins, both belonging to a sub-category he terms the “‘philosophical’ mode of Oriental tale.” The philosophical mode is mainly unconcerned with representing the realities of the geographical east, and instead functions as a “distancing screen” that facilitates “satire or free thought or philosophical fabling.” While “philosophical fable” would be a fairly apt description of Vathek or Rasselas, both conspicuously omit a defining feature of the fable, the closure of a moral lesson. During might have gone on to note that the similarities between the oriental tales surpass a basic interest in philosophy, but that they arrive at their non-conclusions via the same discursive structure of, what Fred Parker refers to as, “an unresolved dialectic.” As Parker writes, this structure of philosophical scepticism probes complex matters

111 During, 277.
112 During, 277.
from the position that “partial and opposite truths can never be brought to bear on an issue […] in such a way as to resolve it.”\textsuperscript{114} Final assessments of scientific modernity find no traction within this discursive mode, nor even does the basic question of whether science is ultimately good or bad. Adam Potkay makes a similar point in his analysis of Johnson’s non-disputational dialectic style, which accommodates, and pays equal respect to, both sides of an issue. The effect of this discursive structure, according to Potkay, is to leave all sides “perilously balanced” ensuring that “any conclusion [is] our own.”\textsuperscript{115} The mechanics of this dialectical structure are, of course, more obvious in \textit{Rasselas}, a tale that, despite its exotic costuming, is essentially a series of conversations that could as easily take place in an English coffee house. But, beneath its gothic exteriors, Beckford’s oriental writing engages in cultural debates over luxury and luxurious knowledge in much the same way.

Whereas \textit{Rasselas}’s unresolved dialectic assumes the conventional form of philosophical conversations, \textit{Vathek}’s unresolved dialectic manifests in the confounding machinations of its plot. The novel teases us with expectations that the pursuit of forbidden knowledge will meet with eternal damnation, but it never quite delivers on these expectations. Beckford implies a straightforward moral by adopting a basic Faustian plot structure, wherein the titular Caliph enters into a pact with the Quranic demon Iblis, who promises supernatural knowledge in exchange for the sacrifice of fifty innocent children. For these and other sins, Vathek is eventually cursed to live forever in the chthonic “abode of vengeance and despair”—along with his ambitious mother, Carathis, and his lover, Nouronihar—his covetous heart literally ablaze with hellfire (143, 147-148). Upon first glance, this tale of unbounded curiosity and infernal retribution adheres closely to the Faustian model. A number of incidental details render it nearly certain that Beckford intended his story to parallel, or parody, Christopher Marlowe’s \textit{Dr. Faustus} (c1588). In one telling passage, Vathek gazes towards the stars to see the sky “streaked over with streams of blood,” which recalls a nearly identical moment in Marlowe’s play, where

\textsuperscript{114} Parker, 237.

Faustus looks towards the stars to see “Christ’s blood streams in the firmament” (63). Until recently, the majority of scholars accepted such similarities as proof that Vathek is essentially a reiteration of the Faust myth.

However, a few have lately begun to regard the intertextuality as ironic, or even facetious. The final paragraph of the caliph’s story straightforwardly declares that “blind curiosity, which would transgress those bounds the wisdom of the Creator has prescribed to human knowledge” shall be met with “an eternity of unabating anguish”; the narrator then solemnly and enjoins the pious reader to live a life that is “humble and ignorant” (148). But, while the central plot culminates in eternal torment for Vathek and his wicked companions, the story actually closes on a bucolic image of the secondary character, Gulchenrouz, passing “whole ages in undisturbed tranquility, and in the pure happiness of childhood” (148). As Keymer notes, “there is something decidedly off-key about these closing gestures.” This abrupt tonal shift certainly jostled Beckford’s translator, the Reverend Samuel Henley. Believing the novel’s moral would be better served by a retributive conclusion, he suggested the Gulchenrouz paragraph “had better be omitted.” Beckford overruled Henley, declaring “the contrast between the boisterous Caliph & the peacable innocent Gul not ill imagined.” Beckford’s rather understated appeal to style ignores Henley’s larger didactic concern, suggesting that Beckford never intended to convey the lesson his translator, and subsequent readers, expected.


So too did Beckford ignore Henley’s suggestion to intensify Carathis’s punishment. Henley wished to see her curiosity turned in upon itself, and “every energy of her soul [become] intensely occupied on her immediate perceptions,” thus dooming her to “wander in eccentric revolutions, without pause or remission.” In the published edition, however, her mind is expunged of “all ambitious projects, and her thirst for knowledge,” and she vanishes “in a rapid whirl that rendered her invisible, and continued to revolve without intermission” (146). Where Henley wished to make Carathis the agent of her own damnation, overwhelming her with sensory input until the only function she is capable of performing is mindlessly pacing out her own elliptical circle of hell, Beckford opted to exorcise her driving sin, before effectively blinking her out of existence. (Note that it is the “whirl” that revolves, and not, as Henley preferred, Carathis.) Thus Beckford grants his intellectual over-reacher a far more merciful fate than the eternal tortures of her mythical forbearer, Dr. Faustus. This crucial detail says much about Vathek’s ambivalence towards curiosity and worldly knowledge, particularly since Carathis proves far more Faustian than her son.

The novel introduces Vathek as a coveter of knowledge, but Carathis is plainly the more devoted scholar. The Caliph, we are told, possesses a damnable curiosity about the natural world, wishing “to know everything; even sciences that did not exist” (47). But as we soon see, and as the ironic narrator eventually tells us, Vathek is “not altogether as active as his mother,” who never loses sight of her goal “to obtain favour with the powers of darkness” (78). Knowledge is the least of his appetites. His is not the mindset of a scholar, but rather of a consumer whose sensual appetites afford him little time for study. This capricious amusement with learning, incidentally, is a common trait among Beckford’s oriental potentates. The canal-building Abou Taher Achmed shares the Royal Society’s conviction that “in the remote ages of antiquity” Egyptians had discovered some “divine wisdom” in nature, which they passed down in the form of hieroglyphics (295). He becomes obsessed with decoding these mysteries, commanding his subjects collect from “all quarters, in the remotest provinces, the strange symbols [to be] copied on linen cloths” (295). Achmed devotes his kingdom’s resources to recovering this ancient knowledge for the space of nearly a page, before becoming distracted by the enchanting

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121 Melville, 131.
Ghulendi Begum. At this point he loses all interest in his newly acquired library of “mouldy” books, “the colour of dead ashes” (297). He abducts Ghulendi from her father, which brings a plague upon his lands, yet these misfortunes he blames on the “hieroglyphics which had been the first efficient cause” (299). This ironic misattribution is strikingly similar to the ending of *Vathek* whose fate the narrator blames on a lust for knowledge, but who actually sets upon his destructive path in search of trinkets, baubles, and automated knick-knacks, including “slippers, which, by spontaneous springs, enabled the feet to walk; knives, that cut without motion of the hand; [and] sabres, that dealt the blow at the person they were wished to strike” (49). And even with his curiosity piqued he is easily, and repeatedly, distracted from his quest. Carathis must continually prod her son down the road to damnation. In the Faustian model, this would seem to render her at least as deserving of perdition as Vathek, which makes it that much more perplexing that Beckford should mitigate the just deserts Henley proposed for her.

Beckford’s choice, however, is in keeping with the novel’s particular dialectical approach to technological modernity. In scenes of scientific ambition, the narrative tone is reliably antithetical to the action or description on the page. The narrator aggrandizes Vathek’s shallow interests in earthly and cosmic knowledge, and banalizes Carathis’s fiendish experiments, thereby unsettling any final conclusions as to the novel’s position on the topic. In describing the Caliph’s opulent palace dedicated to “The Delight of the Eyes,” the narrator boasts that “Rarities, collected from every corner of the earth were there found in such profusion as to dazzle and confound […] Here a well-managed perspective attracted the sight; there the magic of optics agreeably deceived it” (46). Assuming a Gulliverian credulity, the narrator fails to note that Vathek has filled his temple of knowledge with instruments of bewilderment. Moreover, as the description continues, the Caliph is revealed to be less a seeker of arcane knowledge and more a Gimcrackean virtuoso; or, as Beckford writes, a “naturalist” who “exhibit[s] in their several classes the various gifts that Heaven had bestowed on our globe” (46-47). The arid satirical tone similarly masks the shallowness of Vathek’s celestial studies. We may be briefly impressed to learn that Vathek “passed most of his nights on the summit of his tower, till becoming an adept in the mysteries of astrology,” until the narrator clarifies that Vathek spent his time “imagin[ing] that the planets had disclosed to him the most marvellous adventures, which were to be
accomplished by an extraordinary personage, from a country altogether unknown” (49). At this point, the Caliph’s “judiciary astrology,” as the narrator calls it, begins to feel a lot like day-dreaming (49).

The narrator contrasts his inflated descriptions of Vathek’s science with subdued accounts of the sinister experiments performed by Carathis, who, unlike her son, takes full advantage of their palaces’ “materials for the advancement of science” (77). The narrator passes no judgement upon these experiments, which include setting scorpions and vipers upon the “most delicate ladies of the city,” in order to “amuse herself in curing their wounds, with an excellent anodyne of her own invention” (78). To the contrary, he praises her industriousness, explaining that “this good Princess abhorred being indolent” (78). Indeed, the descriptions are most impassive when Carathis’s experiments are most sadistic. At such points, the narrator often adopts the disinterested technical jargon of a naturalist. Describing the horrors of Carathis’s alchemical pyre, for instance, which nearly suffocates an entire city in a cloud of noxious brimstone, the narrator indifferently notes that “Bababalouk [the Caliph’s head eunuch], whose olfactory nerves were more familiarized to magical odours, readily conjecture[ed] that Carathis was engaged in her favourite amusements” (73). Passages such as this subtly implicate scientific objectivity in our hero-villains’ indifference to human suffering. Yet Carathis’s terrible experiments do no more condemn science for its potentially destructive capabilities than do Vathek’s fleeting interests condemn science for its frivolous studies. As R. B. Gill rightly notes, Vathek is a satire without a goal, since there “is no substratum of values” upon which to claim a moral. Rather, like Rasselas, Vathek’s formula is to imply a proposition, negate it, and then negate the negation. In both cases, oriental science remains, like the looming crocodile in the laboratory, a fundamentally conflicted object.

While this chapter focusses mainly on the work of Johnson and Beckford, science has a surprising prevalence in eighteenth-century oriental tales. Though the scientist figure does not appear with quite the regularity of the tyrannical potentate, the scheming vizier, or the alluring virgin, he is a remarkably common feature of stories ostensibly set in regions geographically and

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temporally remote from eighteenth-century England. However, this disjunction did not seem to jar eighteenth-century readers, and is still rarely commented upon by scholars. This curious phenomenon is explained by the peculiar features of the oriental chronotope, which evokes a narrative reality straddling modern genres of fantasy and science fiction. Darko Suvin, a pioneering theorist in the field, defines science fiction as the literature of “cognitive estrangement,” arguing it is fundamentally incommensurable with mythical literature, which “conceives human relations as fixed, and supernaturally determined.”

Fredric Jameson similarly asserts that science fiction, which he traces back to the nineteenth century, signalled “a kind of uneasy and even painful mutation in historicity and the consciousness of the evolution of human [read, industrial] society.” Conversely, he argues, the mythical genre of fantasy relegates itself to the timeless era of the pre-modern, in order to engage with questions of ethics, rather than politics. Yet these distinctions crumble in eighteenth-century oriental fiction. Authors like Johnson and Beckford appeal to the orient’s philosophical universality while simultaneously using it as a surrogate for the England of their time. The spatial-temporal indeterminacy of the oriental chronotope made the region uniquely suitable for engaging with vexing issues of scientific modernity, particularly its entanglement in commodity culture. At the same time, the orient naturalized science within England’s teleological mythologies. Whereas conventional satires resolved anxieties about modernity by staging the failures of science, the orient functioned as a space of constant deferral, rendering such resolutions less urgent. Authors of oriental tales were less inclined to pass any final judgement upon their oriental scientists. Thus, representations of oriental science were less a matter of resisting new realities of the modern world than exploring them from an imagined distance.


Figure 1. Isaac Taylor, *Untitled*, c1800, British Museum, London.

Figure 2. Elisha Kirkall, *Dr. Sylvester Partridge’s Predictions*, 1717, British Museum, London.
Figure 3. William Hogarth, *Hudibras Beats Sidrophel*, 1725, British Museum, London.

Figure 4. Thomas Bewick, *Untitled*, 1779, British Museum London.
Figure 5. Isaac Cruikshank, *A Virtuoso and a Fly*, 1796, British Museum, London.

Figure 6. Anonymous, *An Emblem of Asia* c1800, British Museum, London.
Figure 7. Frontispiece of *Prodomo apologetico alli studi chircheriani*, 1677.
Chapter 5
Elizabeth Hamilton and the Political Scientists: The Paradox of Progress in *Memoirs of Modern Philosophers*

Britain’s enthusiasm for scientific innovation did not come into open conflict with its resistance to cultural innovation until the end of the eighteenth century. These opposing ideologies owed their lasting détente in large part to the remarkable stability of the social hierarchy. Hereditary estates flourished under what Roy Porter describes as “a super-confident proprietorial oligarchy.”¹ For most of the century, Margaret Cavendish’s dramatic analogy between experimental philosophers and militant revolutionaries would have probably seemed quaint or even paranoid to the few people who still read her philosophy.² In the 1790’s, however, science became deeply implicated in a radical reform movement, which seemed to be importing revolutionary zeal from France. It would, of course, be simplistic to attribute this political turmoil to any single factor, let alone a nebulous appreciation for scientific innovation. Yet many prominent reformers—particularly those hailing from dissenting communities in the Midlands—were also scientists, and it was often as scientists that they expressed their republican ideals. In a 1790 letter to the engineer James Watt, for instance, naturalist Erasmus Darwin declared that Britain was “at the dawn of universal liberty,” and that he felt himself becoming “all French in both chemistry and politics.”³ Later the same year, Joseph Priestley inadvertently appropriated Cavendish’s analogy in *Experiments and Observations on Different Kinds of Air* when he famously declared that “the English Hierarchy [… has] reason to tremble […] at an air pump or an electrical machine.”⁴ Thus, Priestley’s treatise on “factious airs” finally articulated the link


² More precisely, she compares “natural philosophers” to “unconscionable men in civil wars, which endeavour to pull down the hereditary mansions of noblemen and gentlemen” (See chapter 1). Margaret Cavendish, *Observations upon Experimental Natural Philosophy*, ed. Eileen O’Neil (Cambridge: Cambridge University Press, 2001), 8.


between science and radical politics that satirists had been implying since the scientific revolution.

It was within this turbulent political climate that Elizabeth Hamilton wrote *Memoirs of Modern Philosophers* (1800), part domestic drama and part burlesque satire of Midlands radicals. Conservatives embraced the novel as an affront to the so-called “Jacobins”, political reformers like Priestley, William Godwin, and Mary Hays, who incorporated scientific materialism and quasi-scientific metaphysics into their political philosophies. The prospect of a domestic revolution provided an incendiary rhetoric for the many anti-Jacobin publications that sprang up alongside Hamilton’s novel, and enemies of reform were swift to brand these philosophers as insurgents and regicides. Allegations of this sort probably did not reflect any imminent threat of revolution in Britain. Mark Philp observes that reformist appeals to French revolutionary principles were mainly rhetorical and did not speak to a widespread desire for revolution. Moreover, as M. O. Grenby claims, the increasing popularity of anti-Jacobin literature in the latter half of the 1790’s reflected a sharp decline in popular support for the Revolution. Hamilton’s novel is somewhat more even-tempered than many other anti-Jacobin publications, and it only ever hints at a link between materialist metaphysics and revolutionary insurgency. In fact, *Modern Philosophers* is always a little conflicted in its politics, just as it is conflicted in its treatment of science. The novel vehemently rejects the political implications of scientific materialism. Yet it welcomes botany, chemistry, and natural history, so long as they support conventional understandings of nature’s God and the social hierarchies these understandings imply. Similarly, Hamilton rejects what Isaac Kramnick terms “bourgeois radicalism,” which he describes as the “self-conscious glorification of the mission of the middle-class.” However, in *Modern Philosophers* and elsewhere, she actually champions Britain’s middle classes, so long as

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they remain rustic and unassuming, which is to say, so long as they remain innocent of the very
dynamism that constitutes their class.

*Modern Philosophers* exemplifies the difficulty conservatives had in trying to bring progressive
science in line with traditional values, and this conflict is inadvertently mirrored in the novel’s
irregular tone. *Modern Philosophers* is in most respects a conventional didactic novel, sober,
sensible, and slightly tedious. Set in a generic Midlands community, the main action centers on
the brief, bittersweet, courtship of the virtuous Harriet Orwell, by the young physician Henry
Sydney; and on the tragedy of Julia Delmont, Harriet’s naïve friend who is seduced by the
scoundrel Valleton and perishes destitute and dishonoured. But interspersed among these
predictable characters—and other blandly respectable ones, like Mrs. Martha, Dr. Orwell, and
Mr. Sydney—are a number of livelier satirical figures who embody what Hamilton sees as the
absurdity of radical philosophy. This group consists of a philosophical guru and Godwin stand
in, Mr. Glib, an indolent shopkeeper, Mr. Myope, a hairdresser masquerading as a philosopher
Valloton, and a mock romantic heroine Bridetina Botherim. *Modern Philosophers* is in some
ways a reformist novel, which, through the intertwined plotlines of Harriet and Julia, argues for
an expansion of women’s rights, particularly in regards to education. However, it is at base a
polemic against cultural innovation, appealing to traditional political and religious authority, and
championing a life of rural simplicity.

The novel does not announce an anti-scientific agenda, though naturalistic and technological
forms of progress spectres throughout. Its most obvious target is Mary Hays’s scandalous semi-
autobiographical novel *Memoirs of Emma Courtney* (1796), which dramatizes Hays’s brief affair
with the reformer William Frend, and her philosophical correspondence with Godwin, who urged
her to live in financial and sexual autonomy. Hamilton’s contemporaries immediately recognized
Bridgetina—whom *The Critical Review* aptly describes as “a compound of garrulity, ignorance,
and affectation”—as an insulting parody of Hays.9 The other main target of *Modern
Philosophers* is Godwin’s *Enquiry Concerning Political Justice* (1793), which, having
discovered two proof sheets as wrapping for her mother’s brown snuff, Bridgetina quotes from

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without context or reflection. The many allusions to *Emma Courtney*, *Political Justice*, and other apparently Jacobin writings—which *Modern Philosophers* sends up in footnotes and in-text references—indicate that Hamilton assumed a readership familiar with and hostile to these texts.

Hamilton’s putatively anti-Jacobin novel dramatizes the threat that “new” (or “modern”) philosophy poses to England’s social and political stability. Like many of her contemporaries, however, she allows this malignant philosophical mode to remain ill-defined. Claire Grogan suggests that Hamilton uses new philosophy “to denote English supporters of the French revolutionary principles of equality, fraternity and liberty,” which may be the case to a large extent.\(^{10}\) However, the term was always a little hazy. John Avery notes that “new philosophy” was applied broadly to any doctrine set forth in *Political Justice* (1793).\(^{11}\) However, he fails to mention that phrase was something of a shibboleth among conservatives, most of whom had probably not read the book. The charge was so common that Godwin complained that “not even a petty novel for boarding-school misses now ventures to aspire to favour unless it contains some expression of dislike or abhorrence to the new philosophy.”\(^{12}\) Though he is obviously biased in his account, Godwin gestures towards a real fervour surrounding the vague concept of new philosophy and towards its materialist metaphysics, which many believed would lead to social decay and even political revolution.

*Modern Philosophers* declares its hostility towards Godwinian metaphysics in the opening pages when Bridgetin boasts that she “never read[s] any thing but novels and metaphysics” (38). This and a few passing references earned praise from *The Critical Review* for the novel’s “ingenious satire […] levelled at the paradoxical metaphysics of Mr. Godwin.”\(^{13}\) The anonymous reviewer does not clarify what he or she takes these “paradoxical metaphysics” to be, and neither, for that matter, does Hamilton. Perhaps this is because Godwin was not a serious metaphysician.

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\(^{10}\) Grogan, *Modern Philosophers*, 35n.


\(^{13}\) *Critical Review*, 311.
*Political Justice* adopts a broadly Newtonian conception of the universe as a machine governed by laws of necessity, though the treatise is not strictly deterministic. Godwin’s causal assumptions are more practical than metaphysical, and *Political Justice* is uninterested in first causes.\(^{14}\) Rather, Godwin approaches human nature and society as an empiricist, likening politics to “mathematics [and] natural/philosophy”, and subsequently asserting that “the moral characters of men are the result of their perceptions.”\(^{15}\) Godwin’s philosophical protégé Hays similarly asserts that “every improvement must be the result of successive experiments, this has been found true in natural science, and it must be universally applied to be universally beneficial.”\(^{16}\) *Political Justice* has little to say about God or religion. However, its methodology is materialistic enough for those of Hamilton’s political stripe to accuse the work of atheistic metaphysics, and it is empirical enough to tarnish other branches of empirical philosophy by association.

The primary currency of Hamilton’s wide-ranging critique of science is the vague, quasi-naturalistic, notion of “energy”, which Glib and his cronies believe can be harnessed to enable an individual to transcend illness, poverty, and nearly “every existing circumstance” (69). They repeatedly invoke this “sublime energy” of mind, which they believe will soon enable them to rise above all natural limitations. Blind to their Satanic pride, they extol this force, which propels them to break “the adamantine chain with which the opinions of society cruelly fetters its unhappy slaves” (159). As will be discussed, the “energy” to which they appeal was an ill-defined concept, popular among late-century scientists and metaphysicians, which vaguely referred to the power of nature. As the Glib coterie use it, however, “energy” is jargon used to justify their defiance of Britain’s political structures and social norms, or, as Myope calls them, “certain prejudices” which are “the greatest obstacle to perfectability” (46). The Philosophers’ glorification of this permissive principle leads them to obsess over the Gonoquais Hottentots—indigenous people of present day South Africa—whose energies, Glib and the others believe,


enable the Hottentots to eschew European “prejudices” and achieve their fullest potential. According to Glib, the Hottentot’s state of political (and sexual) anarchy renders them “the only true philosophers” (153). The modern philosophers’ perverse desire to live in such a society is an obvious affront to Godwin’s philosophy of human perfectability and benevolent anarchy, both of which are tenets of *Political Justice*, as is the philosophers’ foundational belief in mental energy. The notion of energy appears throughout *Political Justice*, as when Godwin declares that “there is nothing that more eminently contributes to intellectual energy, than for every man to be habituated to follow without alarm the train of his speculations.”

*Emma Courtney* likewise appeals to the concept, proclaiming, for instance, that “the mind of energy, struggling to emancipate itself, will entangle itself in error,” and that “apathy is the morbid energy of the soul.” As the above passages demonstrate, however, there is a clear distinction between the energy of Godwin and Hays, which is a synonym for capacity or quality, and the energy of Hamilton’s philosophers, which is a motivating principle, rooted in a materialistic ontology bereft of divine guidance. And herein lies Hamilton’s objection to the empirical worldview: it presumes to disintegrate the basic hierarchies upon which society is structured.

This is not to say that Hamilton opposed science as such. In fact, *Modern Philosophers* attempts to fold various forms of naturalism within her conservative worldview, particularly those that reinforce traditional hierarchies. However, *Modern Philosophers* also exemplifies the disjunction inherent in mainstream anti-Jacobin positions—such as those voiced in periodicals like George Canning’s *Anti-Jacobin* (1797-1798) and its progeny, John Gifford’s *Anti-Jacobin Review* (1798-1821)—that science is valuable, but only in the service of the political status quo. *Modern Philosophers* is conspicuously uncertain of how to naturalize progressive empiricism into conservative politics, which is apparent in the ambivalence of its many references to various scientific fields. Hamilton attempts to navigate this paradox of modern science by demonstrating that science has value so long as it does not intersect with the political world. Thus, her burlesque modern philosophers are made ridiculous in their misguided attempts to bring scientific epistemology into the social world, while respectable characters, like Dr. Orwell and Mr. Sydney,

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17 Godwin, 70.

18 Hays, 188, 244.
endorse a vision of science with almost no overlap onto political society. Ultimately, however, Hamilton is unable to render a wholly apolitical vision of science without perverting it or diminishing it to the point of utter inconsequentiality.

1. Hamilton’s Ambivalence about Science and Reform

Britain’s print market embraced *Modern Philosophers* as a quintessentially anti-Jacobin satire. In recent years, however, revisionist scholarship has been inclined to downplay the novel’s conservatism, and has place it on the moderate end of what Miriam Wallace refers to as the “extended continuum” of Jacobin reformists and anti-Jacobin conservatives.\(^{19}\) Many scholars now assert that beneath its anti-Jacobin pretensions *Modern Philosophers* actually affords a quiet respect to Godwin, Hays, and others. Eleanor Ty claims that the novel’s liberal quotation from philosophical writings of its ostensible targets functions as a “double voice” in the Bakhtinian sense, “which allows for some textual and ideological gaps in the novel.”\(^{20}\) Janice Thaddeus similarly claims that *Modern Philosophers* was “too intelligent for its audience.”\(^{21}\) Its contemporary readership, she claims, was not canny enough to recognize the novel’s sympathies towards reformers’ opposition to the war with France, their call to improve conditions for the unemployed and impoverished, and, especially, their campaign to improve girls’ access to education.\(^{22}\) These assertions by Thaddeus and Ty dovetail particularly well in reference to issues of gender. The novel is most equivocal in its treatment of Mary Wollstonecraft. Hamilton implicitly scorns Wollstonecraft’s liberal attitudes towards sex and marriage when—recalling Wollstonecraft’s affairs with Henry Fuseli and Gilbert Imlay—Bridgitina follows Valleton to


\(^{22}\) Thaddeus, 412.
London “to live together without being married” (225). Yet Hamilton elsewhere pays tribute to A Vindication of the Rights of Woman, which Henry Sydney praises as “an ingenious publication” by a “very sensible authoress” (101). Scholars like Wallace, Ty, and Thaddeus note several similarly incongruous moments throughout Modern Philosophers, demonstrating that Hamilton’s politics were more complicated than many of her contemporaries were willing to admit.

Scholarship of this sort has done well to expand a critical tradition that previously regarded Modern Philosophers as a one-note satire on political reform. However, it can be easy to overstate her progressive leanings, as Thaddeus does in claiming that Modern Philosophers “supports energy and independence.” Claire Grogan rightly cautions against approaching late-eighteenth-century politics as a rigid binary between Jacobin progressives and anti-Jacobin conservatives, asserting that Hamilton “struck out her own path between these two extremes.” However, we should not take this to mean she occupied a perfectly central position. As this chapter argues, Modern Philosophers’ abiding suspicion of natural philosophy—which manifests in critiques of almost every aspect of empirical study including anthropology, botany, chemistry, and mechanical engineering—bespeaks a deep resistance to cultural reform, which does indeed place her to the conservative end of the continuum.

Hamilton’s attitude towards science vacillates throughout the novel, not in the manner of a cagey satirist whose genuine opinions are too subtle for her readers, but rather as a political writer suffering a conflict of ideologies. By the late eighteenth century, empirical study had mostly overcome its social precariousness—to call it “science” in the modern sense is hardly even an anachronism—and few would explicitly deny its value. Accusations of science as a frivolous discipline, which had once characterized its public reception, had declined sharply, largely aided by Joseph Banks’s tenure as president of the Royal Society from 1778 to 1820. Under Banks, the Society intensified its focus on practical knowledge, while deliberately entwining its own pursuits with those of the government and ruling elites. By Hamilton’s time, technological advances had rendered accusations of frivolity untenable, and the Royal Society had cemented

23 Thaddeus, 412.

the status of science as “a loyal servant of the established order.”

Even Edmund Burke, among the era’s most vocal sceptics of science, was willing to concede that studying “the Laws of Nature” had value, as they were ultimately “the Laws of God.”

In the abstract, Modern Philosophers advocates science in a manner well in line with the conservative mainstream, as a tool for upholding the status quo and for better understanding God. Yet, as we shall see, nearly every episode involving science conveys a sense of unease, and at least a vague notion of empiricism as a threat to social harmony.

Modern Philosophers adopts a more sceptical attitude towards science than Hamilton herself seems to have held. Hamilton’s education at a boarding school in Stirling exposed her to a wide range of subjects including “geography, and the use of globes,” to which she applied herself “with much assiduity, and with a degree of success that delighted her master.”

Her primary interests seem to have been literature and music, but her tutelage in the physical sciences would continue. As an adolescent in Edinburgh she became acquainted with Dr. Henry Moyse, a lecturer on experimental philosophy noted for his willingness to instruct young women in the sciences.

Hamilton entered into a correspondence with Moyse “in which the lecturer liberally undertook to direct the studies of his youthful pupil.” References throughout her writing indicate an ongoing interest in science. Her Letters on the Elementary Principles of Education (1801) regularly employ naturalistic metaphors, as when she warns that if pride, arrogance, and anger “are not stifled in the birth, they may afterwards be cut into pieces by the rod of chastisement; but, like the Polypus, they will preserve the vital principle, and be immediately re-

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28 His lectures earned him a warm tribute in the anonymous poem, “An Address to the Late Dr. Moyse, by the Ladies of Edinburgh,” The Belfast Monthly Magazine 7.39 (October 31, 1811), 298-299.

29 Benger, 1: 46.
produced.” Similarly, an entry in her private journal from 1809 displays a sophisticated understanding of atmospheric gases when she cites respiration as evidence for divine providence. As she writes, “the air, on which the lungs are thus dependent, is not itself a simple element, but compounded of many distinct and separate gases, any one of which, breathed singly, would be fatal to life; but, by the divine will, they are mingled in such nice proportions, as adapts them to the purpose of sustaining the lives of all that live.” Modern Philosophers thus stands apart from Hamilton’s other writing in adopting a consistently suspicious attitude towards science. This anomaly makes sense, however, when considering that it is also her most overtly political work, and the one most concerned with rebutting those who would manipulate new scientific theories to further their own social-political ambitions.

Hamilton’s difficulty negotiating a cultural space for empirical study reflects a larger problem of how to isolate science from the nexus of rising industry and of political reform. Her critiques are often subtle and passing, and she does assume a conventional position that the study of nature can be a form of Christian worship. Yet the frequency with which she undermines science, even that of her sympathetic characters, indicates deep misgiving towards all manner of empirical studies. Moreover, nearly every one of her anti-scientific jabs is framed as a rebuttal against middle class agitators such as Godwin and Priestley, whose materialist philosophy, Bridgetina declares, will abolish “all the unhappy distinctions of station and rank” (207).

2. **Science and Culture War in Late-Eighteenth-Century Britain**

Science was a crucial proxy in the culture wars of the late eighteenth century. Conservatives and reformers were acutely aware that science was now mainly the purview of those whom Priestley calls the “men of leisure, spirit, and ingenuity, in the middle ranks of life.” The same advances

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31 Benger, 1: 257.

32 Priestley, xxvi.
in commerce and manufacture that allowed hereditary wealth to flourish, depended upon, and increased the relative economic power, of those in the middle ranks.\footnote{As Priestley notes in his preface, xi.} Conservative publications like the \textit{Anti-Jacobin Review} often seemed self-contradictory in wanting to stem middle-class progress. For instance, one article of the \textit{Review} calls for a “determined rejection of every attempt to innovate [politically],” while another article from the same issue glorifies the “general progress of Improvement of every description throughout the Country.”\footnote{\textit{The Anti-Jacobin, or Weekly Examiner} (London: 1799), I, 386; \textit{Anti-Jacobin}, I, 144.} \textit{Modern Philosophers} faces the same dilemma in its treatment of capitalist expansion as it does with scientific innovation, the impossible desire for improvement without progress.

Priestley’s declaration that scientific machinery could threaten the political establishment gave voice to anxieties that had been simmering since the beginning of the scientific revolution. Historians of science, such as Simon Schaffer, have asserted that Priestley’s claim “was not typical for an English natural philosopher of the 1770’s.”\footnote{Simon Schaffer, “Priestley and the Politics of Spirit,” \textit{Science, Medicine and Dissent: Joseph Priestley (1733-1804)}, ed. R.G.W. Anderson and Christopher Lawrence (London: Wellcome Trust Museum, 1987), 40.} Yet, as this dissertation has been arguing, scientific progress had always been recognized on some level as politically destabilizing. Priestley was simply one of the first to openly state what satirists had been implying for decades. Even without its inflammatory preface, the radical implications of \textit{Observations on Different Kinds of Air} could not be missed. As a scientist, Priestley revolutionized the study of atmosphere by anatomizing the “common air,” which had, to this point, been regarded as a single, unified, element. He deliberately framed his atmospheric model in terms of political dissent, preferring the charged language of “factious airs” over the neutral language of “gasses,” which had been available since the seventeenth century. As Jayne Elizabeth Lewis notes, Priestley’s notion of air as a staging ground for political conflict immediately gave rise to “the liveliest sociopolitical metaphors of his era.”\footnote{Jayne Elizabeth Lewis, \textit{Air’s Appearance: Literary Atmosphere in British Fiction, 1660-1794} (Chicago: University of Chicago Press, 2012), 196-197.} His “factious airs”
offered a dynamic and non-hierarchical vision of nature, which could be applied to other areas of naturalism as well as the political world.

Yet conservatives had little trouble responding to Priestley’s dynamic vision of nature, which they did both by emphasizing the apparent danger in his chaotic vision of nature, and by smearing his politics and science as Jacobinism. Priestley may well have been disheartened by how easily they were able to appropriate his dynamic vision of nature in their own political rhetoric. Maurice Crosland notes that it was with Priestley in mind that Burke deployed his most famous scientific metaphor, likening the French Revolution to a gas emitted in a chemical explosion.37 As he declares, “the wild gas, the fixed air is plainly broken loose.”38 Not-so-subtle allegations of this kind resulted in widespread disavowals of Priestley, whose reformist politics became hopelessly intertwined with his chemistry (and all chemistry by extension), and all of which were tarred by association with the French Revolution.39 As late as the 1830s, scientific communities venerated him as a brilliant thinker whose ideas had nonetheless been compromised by his radicalism. In 1833 when a group of prominent scientists gathered for the centenary of his birth, they adamantly dissociated themselves from his politics, arguing that “their science was superior to that of the ‘founder of pneumatic chemistry’ precisely because they had not allowed themselves to become prey to party politics.”40 Historians of science still contend that his “chemistry was really Jacobin,” despite the fact that English Jacobinism was always predominantly a myth.41

Though many Britons in the late eighteenth century declared themselves anti-Jacobins, and others like Hamilton tacitly fashioned themselves as such, anti-Jacobinism was never a coherent


39 Crosland, 288.


41 Schaffer, 39.
political program. It was, rather, a loose designation of support for the political status quo, defined in opposition to an essentially non-existent political movement. Scholars have historically overestimated the uniformity of Jacobinism, which has been described as “a complex of values and beliefs formed from the empirical psychology of Locke and Hartley, the republican politics of the eighteenth-century ‘Commonwealthmen’, the rational religion of the Scottish philosophers, and the historical optimism of the French Enlightenment.” Yet there were never many self-proclaimed Jacobins in England, and their numbers plummeted after 1792 when France’s democratic uprising turned gruesome and further in 1793 when the *Convention nationale* declared war on England. Even the apologist Richard Dinmore, in his *Exposition of the Principles of English Jacobins* (1796), distances himself from the label by referring to Jacobins in the third person, and by stressing that he uses the term only “because their enemies choose so to call them.” By the mid-1790’s “Jacobin” was less a political affiliation than it was a hyperbolic accusation to level against those proposing even moderate political reform. As Grenby notes, it was an all-purpose smear, which could be applied to “anyone from the followers of Fox and the Society of the Friends of the People to the enemies of the slave trade or those, who like Hannah More herself, sought to establish Sunday schools.” Though anti-Jacobin communities flourished, often enjoying state sponsorship, the term itself was seldom more than a vague declaration of conservatism, and of loyalty to Britain and its Monarchy.

Hamilton never explicitly marketed *Modern Philosophers* as an anti-Jacobin novel, but she did little to disabuse critics and readers who praised it as one. In later years, she disavowed political partisanship, and, according to her biography, claimed to have written *Modern Philosophers* as a vehicle for both “Aristocrats and Democrats” to “laugh at what was ridiculous” in the follies and absurdities of human nature. The novel bears this claim out in the strict sense that it satirizes political and philosophical trends through broad character types, and it does not articulate or


44 Grenby, 7.

45 Benger, 1: 132-133.
refute any specific political programme. Yet Hamilton could not have been surprised that *Modern Philosophers* was received as a trenchant attack on the personal and political writings of Godwin, Hays, and those affiliated with them. Neither could she have been surprised that her audiences recognized the clusters of ideas espoused, however loosely, by her satirical targets as Jacobinism. Indeed, *Modern Philosophers* sold very well as an anti-Jacobin novel, bolstered by glowing reviews from conservative publications like the *British Critic*, and being one of only a small number of works to receive unqualified praise from the *Anti-Jacobin Review*.46

Hamilton’s strategy of implied political attack was popular among anti-Jacobin novels (putative or affirmed), as it “obviate[ed] the need for description or analysis of philosophical or political propositions.”47 This mode of passive-engagement is precisely the way in which *Modern Philosophers* approaches science, and for the same reasons. The novel’s subtle but unmistakable disdain for science is highly political in its opposition to the culture of innovation—or, as Myope tautologically calls it, “the progress of improvement” (156)—that science represented. *Modern Philosophers* is, in this way, quintessentially anti-Jacobin, particularly if we understand Jacobinism in the impressionistic sense suggested by Carl Cone, who claims it was “a state of mind, a cluster of indignant sensibilities, a faith in reason, [and] a vision of the future.”48 Hamilton was not the only conservative writer to have inferred a relationship between science and the innovative spirit of her time.

Science was an important battleground in the turbulent atmosphere of the late eighteenth century, with conservatives and reformers each attempting to tailor it to their positions. The French Revolution engendered suspicion towards science since empirical study was widely associated with Revolutionary politics. Spectres of scientific conspiracy made their way into mainstream political discourse. Burke warned of an international cabal of radical philosophers, threatening to dismantle Britain’s political society. These were, he writes, “a sect of fanatical and ambitious


47 Grenby, 70.

atheists [...] aiming at universal empire [...] beginning with the conquest of France.”\textsuperscript{49} While this claim may be intentionally excessive, it spoke to a widely-held association between empiricists, metaphysicians, and political radicals. For Burke and others, “scientists like Priestley, political writers like Paine and Godwin and the French \emph{philosophes} were all in the same category.”\textsuperscript{50} Yet not even the staunchest anti-Jacobin publications, like Gifford’s propagandistic \emph{Anti-Jacobin Review}, ever adopts a wholly anti-scientific stance. Rather, cultural conservatives, like their reformer adversaries, competed to bring science onside with their own political ideologies.

In an apparent move to separate useful science from the chaff of radical politics, the \emph{Anti-Jacobin Review} actually promoted a wide range of scientific texts including W.G. Browne’s anthropological \emph{Travels in Africa, Egypt, and Syria} (1799) and John Cullyer’s \emph{Gentleman and Farmer’s Assistant} (1798), which the \emph{Review} praised for the “Accuracy and Utility” of its mathematical approach to agriculture. In the same spirit, \emph{Modern Philosophers} professes an appreciation for the physical sciences as long as they remain apolitical and, most importantly, Christian. Thus, Hamilton attempts to distance the faux-science of her burlesque modern philosophers with legitimate studies, like Henry Sydney’s chemistry and medicine, or his father’s botany. Unlike the \emph{Review}, however, \emph{Modern Philosophers} never seems totally convinced that scientific innovation can be separated from cultural innovation. Hamilton’s novel is nowhere near as alarmist as some anti-Jacobin publications, though it expresses some basic apprehensions about cultural upheaval. While scholars now tend to approach Hamilton as a political moderate, she was in many ways less conciliatory to the science of her day than more ardent conservatives.

In order to distance the burlesque science of her modern philosophers from that of legitimate authorities, Hamilton draws upon the hoary convention of the scientist as enemy to all things useful. Echoing Nicholas Gimcrack’s pompous declaration that he “seldom bring[s] anything of


\textsuperscript{50} Maurice Crosland, “The Image of Science as a Threat: Burke versus Priestley,” \textit{The British Journal for the History of Science} 20.3 (July 1987), 292.
use,” for instance, the deferential Mrs. Botherim boasts that her daughter “Biddy is a great scholar! You will find, if you converse with her a little, that she is far too learned to trouble herself about doing any thing useful” (38).51 This move serves the double function of tying the modern philosophy of William Godwin to the burlesque science of a Gimcrack type, and of invoking readymade critiques of scientific frivolity to a political philosopher whose doctrine of general utility was a favourite target for anti-Jacobin writers. Hannah More facetiously invokes Godwinian utility in her review of Memoirs, making a punch-line of the concept. More’s final musing, which takes the form of amiable criticism, laments the book’s high price, which “though it is not beyond the value of the work […] will check the extent of its circulation, and of course impede its progress towards ‘general utility.’”52 The novel itself is unrelenting in its assault upon the notion of general utility, particularly through Bridgetina’s benighted recitations from Political Justice, as when she condescendingly explains that a friend’s education has “been too confined to enable [her] to follow an energetic mind in which passions generate powers, and powers generate passions; and powers, passions, and energies, germinate to general usefulness” (222). The metaphysical tautologies underscore what Hamilton regards as the emptiness of modern philosophy’s claims regarding human energies and perfectability.

Unlike Burke, Hamilton does not explicitly equate scientists with French Revolutionaries, but Modern Philosophers implicitly posits moral degeneracy as the natural consequence of a materialistic worldview. The novel elicits humour from its philosophers’ invocations of science, and related forms of metaphysics, as casuistic justifications for plainly immoral behaviours like indolence, seduction, and theft. But science has a darker presence in the novel when scientism refigures the ordered world of Creation as an indifferent and unguided machine. Characters are prone to get carried away with the notions that organic beings as automata. Such instances provide occasional chuckles, but the consequences are always severe.

The first instance occurs at the beginning of the second volume, and while mainly comical, introduces an element of violence to the utopian idea of a mechanical, and perfectible, nature.

51 Thomas Shadwell, The Virtuoso, ed. Marjorie Hope Nicolson and David Stuart Rodes (Lincoln: University of Nebraska Press, 1966), 47.

Vallaton’s groom is staunch admirer of Frederick the Great, whose “improvements en l’art militaire, may in time […] bring a great part of the human race into the desirable state of automatons” (153). Accordingly, it is with strict military precision that he follows Vallaton’s instructions to ready his horse for a journey. Like the credulous Bridgetina, however, the groom’s rigid training renders him incapable of independent reason. His master’s instructions “only extended to putting up the chaise, and as taking off the harness, rubbing down the horse, and giving him either food or water, made no part of his orders, [so] he very properly stopped short at the point of literal obedience, and presumed not to harbour a single thought of the consequences” (153). Predictably, the horse collapses from starvation, throwing its riders, and breaking several of Vallaton’s bones.

The injuries resulting from the groom’s desire to become an automaton are relatively minor, but they reflect the novel’s broader concerns about the violence that must necessarily result from a society based upon principles of automation and mechanical perfectibility. Hamilton upholds the terror of the French Revolution as the inevitable result of a society based upon a conception of mechanized efficiency with no reference to common-sense Christian morality. Thus, with a dark irony, the narrator praises the efficiency of the guillotine, or, as she calls it, “the machine” (61). Vallaton, the most unscrupulous of her modern philosophers, admires the “charming contrivance,” for how effectually “it stop[s] the mouths of troublesome people,” by which he means those who might reveal his own criminal machinations, or those from whose death he stands to profit. Moreover, he cynically uses the notion that he is an automaton to absolve himself of the responsibility for his crimes.

In a crucial episode, Vallaton recounts an experience he had in France in which he had an old man arrested for crimes against the people. On doing this, however, he experiences a rare moment of contrition for a crime more heinous than his usual petty larceny. Yet he immediately acquits himself of his guilt by reasoning that “he was but a passive instrument: no more to blame than the guillotine which should behead [the man]” (65). And upon receiving confirmation of the man’s death he once again appeals to his mechanical nature to exculpate himself, declaring “I am but a machine in the hand of fate” (65). Hamilton thus demonstrates that easily manipulated
principles of automation and energy function as convenient tools for unscrupulous people to absolve themselves of moral accountability.

Moreover, while Hamilton adopts a conventionally sympathetic attitude towards science-as-religion, *Modern Philosophers* is so full of casual needling that she seems almost unintentionally critical. Through the didactic voice of Orwell, for instance, she urges her readers not to cede undue authority to “the chimeras of fancy” that result from a materialistic worldview. “The investigation of experiment,” he continues, is apt to neglect the “uncaused Being, in whom all the beauty and order, all the wisdom and power, displayed throughout the universe are centred” (311). Thus for Orwell, as for Hamilton, the study of nature should be at best a form of worship, and at worst an innocuous hobby. Even the most benign forms of naturalism are reduced to comedic material. Although Hamilton does not disparage science outright, she sports with its apparent triviality throughout the novel. The extemporaneousness of these moments of jests renders them in a sense more damning than direct critiques, as they quietly assume the triviality of science. For instance, Hamilton avoids what might have been a genuine moment of pathos for the romantic Quixote Bridgetina by describing her dejected tears in terms of experimental philosophy. Upon witnessing the apparent happiness of Julia and Vallaton, Bridgetina weeps in the manner of a novelistic heroine, yet Hamilton trivializes her distress by musing on the chemical composition of her fluids, writing that “a very careful analyzation must [be] performed, to know with certainty the difference of the component parts of salt tears, and bitter tears, and sweet tears, and sweet-bitter tears, and salt-delicious tears, and tears half-delicious, half agonizing, &c. &c. upon which a very pretty neat course of experiments might undoubtedly be made” (197). This innocuous passage does not directly reprove science, but the association between naturalism and Bridgetina’s infatuation belittles experimentation nonetheless.

Hamilton does not reserve her implicit criticism of science strictly for Bridgitina and her burlesque coterie. Of the novel’s moral paragons, Doctor Orwell and Mr. Sydney, only the former is totally above reproach, while the latter is rendered slightly less admirable due to his scientific preoccupations. Hamilton makes a point of linking Mr. Sydney’s, admittedly minor, social and moral shortcomings with his naturalistic studies. While both Orwell and Sydney
delight “in literature and science,” Orwell’s tastes are more traditionally genteel, preferring “literature, and the belles letters” to Mr. Sydney’s “abstruser studies,” and favouring gardening over Mr. Sydney’s more rigorous study of botany (43). Mr. Sydney is an admirable character, but his preoccupation with natural curiosities has a tendency to take precedence over his social obligations, as when a “moth butterfly, of rare and uncommon beauty, happened to alight on a neighbouring honey suckle; and to discover whether it was the **** **** of Linnaeus, or the **** **** of Buffon, was a matter of too great importance […] not to deserve the most serious attention,” causing him to miss spending time with Dr. Orwell and his family (73). Hamilton presents Mr. Sydney’s absentmindedness as a quirk, rather than a serious character flaw, yet she clearly demonstrates that Henry Sydney’s are more proper, when he eschews his father’s discovery and “advance[s] to the saloon where he knew the family of Dr. Orwell usually spent the morning.” (73). The virtuous Henry Sydney recognizes the importance of natural and experimental knowledge, but unlike his father, he also recognizes the higher importance of community and family, to which science is implicitly set in opposition.

3. Science or Nature’s God

While mainstream conservatism attempted to bring science into the service of familial and religious hierarchies, Modern Philosophers betrays suspicions about whether naturalism can ever be compatible with such traditional structures. Just as Bridgetina is a throwback to the Gimcrack type, the admirable philosophers from Memoirs are also throwbacks to the earliest days of the Royal Society in which the purpose of the new sciences was to find a direct communion with God. Anti-Jacobin publications embraced the physical sciences, but only so long as they were put into the service of divinely ordained hierarchies, or, better yet, when they were kept out of the political domain altogether. In a bizarre but telling account of Margaret Bryan’s Compendious System of Astronomy (1799), for example, the Anti-Jacobin review comments at length upon the “beautiful engraving of Mrs. Bryan and children, which will, at least have the effect to undeceive such readers as might have entertained unfavorable ideas of the external charms of female philosophers and mathematicians.”53 Thus the publication is able to commend

the empirical sciences, so long as they are subordinate to a conservative, patriarchal, vision of domesticity. Likewise, Hamilton superficially encourages the scientific pursuits of her sympathetic characters, while simultaneously denying them any social or religious merit.

Juxtaposed with the burlesque modern philosophers, whose strictly theoretical understanding of science is continually shown to be deficient, are three competent scientist figures, whose knowledge is grounded in a combination of empirical practice and scriptural theory. Through these three men, Henry Sydney, his father Mr. Sydney, and Doctor Orwell, Hamilton expresses her belief in naturalism as a form of worship. Of these dignified men, Doctor Orwell stands out as Hamilton’s didactic mouthpiece. As such, it is Orwell who most clearly and frequently espouses a Boylean conception that science is a means to study the Kingdom of God, rather than the governments of men. Hamilton repeatedly aligns Orwell with the Christian virtuosi of the early Royal Society, in spite of his expressed disdain for the “infancy of natural philosophy,” in which “the ill-detected diligence of the chemist was wasted upon trifles, while the grand laws of nature were unnoticed and unknown” (312). It is towards these “grand laws of nature” that Doctor Orwell encourages Henry to pursue in his own chemical studies, cautioning Henry against any kind of political application.

In a long epistle, Doctor Orwell details the various local intrigues transpiring in his absence. He also spends a long period discussing the scientific experimentation Henry performs as part of his medical practice. Doctor Orwell is “delighted with the success of [Henry’s] chemical experiments,” but cautions the young man not to attempt to apply his science to the political world (311). Clearly intended to recall the political science of Godwin and other modern philosophers, Orwell warns that such speculations have “a direct tendency to influence the moral character of man” (311). Science, he implies, is uniquely fraught in that it forces the practitioner to a moral crossroads where he must choose whether he is studying God or the world.

This caution against putting too much stock in his chemical experiments exemplifies the novel’s conflicted attitude towards science. While at once upholding the admirable religious impulses behind various naturalistic practices, Hamilton explicitly connects late century science with earlier suspicions of unfettered empiricism. This disjunctive attitude towards modern science is
especially apparent in her repeated invocation of a passage from Alexander Pope’s *Essay on Man* (1734) that extolls the virtue of unstudied faith:

> Yet poor with fortune, and with learning blind,
> The bad must miss, the good, untaught will find;
> Slave to no sect, who takes no private road,
> But look through nature up to nature’s God:
> Pursues that chain which links th’ immense design,
> Joins heav’n and earth, and mortal and divine;\

Throughout the century, scientists and scientific enthusiasts repeatedly invoked Pope’s concept of “nature’s God.” It frequently prefaces popular scientific publications such as Benjamin Martin’s *General Magazine of Arts and Sciences* (1755-1765), where it appears twice in the magazine’s introductory poem, “On the Usefulness of Natural Philosophy”; or, as an epigraph to a 1786 translation of Carl Linnæus’s *Reflections on the Study of Nature*. Yet Pope’s *Essay* resists this application, as it is those of “learning blind,” and the “good, untaught” who find God “through” (not “in”) nature. Hamilton appeals to the conventional interpretation of Pope’s phrase when she has Orwell instruct Henry that “the study of Nature lead[s] us up to Nature’s GOD,” but she immediately undermines this with the warning that “non-important forms and dogmas” that obscure “those grand and simple truths which are marked with the signet of Nature’s GOD” (312). While God may be found in the complex systems of nature, such studies are entirely redundant when, properly, approached with a Christian certainty.

This oscillation between veneration and negation of scientific study recurs throughout *Modern Philosophers*, with the Christian imperative continually blunting what little value Hamilton


seems to afford it. Even the uncontroversial study of medicine is diminished with Bridgetina’s love-struck glorification of Henry’s studies. She boasts of his noble pursuit of medicine and eagerly anticipates a time when “mankind are sufficiently enlightened to cure all diseases by the exertion of their energies,” and of how the research of Henry and his kind will surely contribute to the inevitable “perfectibility of [the] species” (71). As usual, Bridgetina completely misinterprets Henry’s research. But while Henry’s refusal to correct the “shallow understanding [of a] mind totally occupied by two or three ideas” (71), effectively repudiates this Godwinian jargon, it also allows Hamilton to avoid commenting upon the value of Henry’s scientific research. The chapter ends with Henry and his father disengaging from the conversation; and, in an implicit rebuttal to Bridgetina’s inanity, the next chapter opens with Mr. Sydney, as naturalist, “expatiating on the charms of nature […] ‘from Nature up to Nature’s GOD’” (72). In this, and several other moments, Hamilton assumes a theoretically sympathetic attitude towards empiricism, which she subsequently undermines with her ungenerous attitude towards it.

3.1. Dissenting Politics and the New Jerusalem

Hamilton’s discomfort with the merging of religion and science was part of a larger cultural unease with the growing influence of dissenting communities, which brought both religion and science to bear against aristocratic power structures. And, while anti-Jacobin rhetoric tended towards the alarmist, apprehensions that new models of nature might be used to challenge political hierarchies were not totally unfounded. At the time of Hamilton’s writing, much of Britain’s most progressive science was being performed by the same intellectual communities that were actively functioning, to borrow Harold Perkins’s metaphor, as the midwives of the middle class. Religious sectarians were “among the most active members of the various Revolutionary Societies,” and these same religious and political networks “served to create cultural neighbourhoods for small groups of geographically dispersed Dissenting intellectuals.”

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56 According to Grogan, this imperfect quotations is “most likely used by Hamilton to echo Pope’s Essay on Man, Epistle iv, line 331” (72n).

which “emerged as the scientific and technical associations of industrialization.” Thus empirical science and reformist politics were always mutually implicated. Anti-Jacobin publications were attentive to the network of scientific Dissenters, and regularly framed political attacks as attacks on science, and vice versa.

Hamilton’s reluctance to legitimize naturalism as a form of worship—which was at the time a fairly uncontroversial position—is, at least in part, a reaction against the natural theology of dissenting reformers. While *Modern Philosophers* extends a limp olive branch to naturalism as theology, the novel is plainly concerned with the ease at which a non-ecclesiastical study of god can degenerate into dangerous religious and political extremism. Thus Hamilton is not content to slyly undermine the theology of her political targets, but instead presents their philosophy as a kind of religious zealotry, which she does foremost through her Godwin stand-in Mr. Glib. The apparently disinterested rationality of Glib’s political science is undermined by his “inflammable imagination” and proclivity towards enthusiastic religious sects (145). Though we meet him during an atheistic phase, we quickly learn that his sympathies for modern philosophy are grounded in “his zeal for the minutiae of every dogma of the sect he happened to belong,” and that he had habitually directed his “energies,” as Hamilton pointedly notes, to the Quakers, Anabaptists, and Calvinists (145). Hamilton repeatedly tropes Glib’s devotion to modern philosophy as merely another form of enthusiasm to a marginal, and therefore socially destabilizing, religion, writing, for instance, that as “convert to the new philosophy, his zeal was no less conspicuous” (145). Hamilton implicates empirical science in sectarian religion and political radicalism through Glib’s final conversion to the Church of the New Jerusalem.

The fact that Glib ends up in the Church of the New Jerusalem is no insignificant detail, as New Jerusalem stood at the nexus of radical theology, revolutionary politics, and empirical science. The Church was inspired by the mystical visions of the late scientific prodigy turned theologian Emanuel Swedenborg (1688-1772). Swedenborg had not intended to found a church, nor had

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he lent his support to radical politics; however, his emphasis on an individualistic, anti-
hierarchal, experience of God and nature dovetailed with contemporary discourses of
ecclesiastic and political reform. After 1789, Swedenborg and his church became closely
associated with the French Revolution. Richard Brothers’s sensational publication on the
Wonderful Prophesies (1795), for instance, apocryphally credits Swedenborg with having
predicted that the “noble nation of France [would] rise as one man, break her chains, and
overthrow the whore of Babylon.” At the same time, conservative reactionaries claimed that a
repeal of the Test and Corporation Act could result similar revolts at home, spearheaded by anti-
Anglican factions, the “Swedenburgians” among them. Moreover, publications such as Abbé
Barruel’s Memoirs Illustrating the History of Jacobinism (1799) anachronistically implicate
Swedenborg in the philosophy of “Equality, Liberty, and Independence, which the learned
Jacobins pretend to have been anterior to civil society.” It is doubtful whether Hamilton
actually bought into these accusations, or even more fantastic claims linking Swedenborg to the
secret society of the Illuminati. Yet Swedenborg’s Church offered an easy caricature of how
scientific thought could simultaneously tarnish church and state.

Though not overtly scientific, Swedenborg’s mystical writings were frequently critiqued as
extensions of his early naturalism. And indeed, his scientific background is occasionally apparent
in the empirical report of his visions, which “consisteth in seeing, from matters of experience and
science, truths, the causes of things, their connections and consequences, in regular order.”
These truths, he claims, granted him “an experimental knowledge” of the divine. This scientific

60 For a fuller account of Swedenborg’s influence on dissenting politics, see Robert Rix, “William Blake and the Radical

61 Richard Brothers, Wonderful Prophecies (London, 1795), 41.

62 Reverend Mr. Bradshaw, A Scourge for the Dissenters (London, 1790), 51.

63 Abbe Barruel, Memoirs Illustrating the History of Jacobinism (Hartford, 1799), 1: 95.

64 Emanuel Swedenborg, Extracts from the Theological Works of the Hon. Emanuel Swedenborg, trans. unknown
(London, 1794), 43.

65 Emanuel Swedenborg, A Treatise Concerning Heaven and Hell, trans. Rev. Thomas Hartley (London, W. Chalklen,
1789). 185
tenor was not lost on detractors, and much of the criticism directed towards the Church of the New Jerusalem juxtaposed Swedenborg’s apparently fanatical theology against England’s canonical empiricists. The reverend John Bennett, for instance, upholds Swedenborg as foremost of those fanatical practitioners of “moral chymistry […] that neither Sir Isaac Newton nor Mr. Locke, with all their clearness of conception, could have been able to understand.”66 Priestley draws similar associations, in his Letters to the New Jerusalem Church, which twice compare Swedenborg’s mysticism unfavorably to the useful work of “a Boyle, a Newton, or a Franklin.”67 Many of Swedenborg’s supporters welcomed the notion of New Jerusalem as a scientific church, including Dr. William Spence, who answered Priestley’s Letters with a long tract in defense of Swedenborg, which interspersed theories of medicine, animal magnetism.68 There is no reason to imagine Hamilton followed these particular debates, but she could hardly have missed the Church’s significance in terms of revolutionary science.

4. Science, Sex, and Family Breakdown

The French Revolution remains a presence throughout Modern Philosophers, though Hamilton often implicates science in violent revolt in a roundabout manner. Her preferred strategy, popular among anti-Jacobin polemics, is to link the empirical, atheistic, worldview of her philosophers with moral corruption and cultural degradation. To this end, she regularly equates empirical philosophy with illicit sexuality. For instance, she inflects Mr. Glib’s initiation into the pseudo-naturalistic Church of the New Jerusalem with a strong hint of sexual debauchery, writing that “he sealed his conversion by uniting himself to his inductress; and is now employed in writing a quarto volume to prove the possibility of an intercourse with the world of the spirits” (emphasis mine, 387). This suggestive diction is a regular feature of Modern Philosophers, as when the novel describes Bridgetina’s seduction fantasies in terms of the newest engineering, balloon travel. Fantasizing about a tryst with Henry Sydney, Bridgetina “work[s] her mind into a state of

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66 John Bennett, Letters to a Young Lady on a Variety of Interesting and Useful Subjects, vol. 1 (London, 1795), 130.


effervescence, whose airy fumes so completely fill the light balloon of fancy, that judgment and
common-sense (like the adventurous [Montgolfier] brothers of aerostatic memory) suffered
themselves to be carried along by its wild career” (219). This improbable link between science
and sexuality was common among politically conservative writings of the late eighteenth
century. Anti-Jacobin publications regularly employ the language of science to describe what
they regard as sexual deviancy, particularly female promiscuity. For instance, Jane West draws
upon these prefabricated associations in her novel The Infidel Father (1802), wherein she
conveys a young woman’s sexual vulnerability in terms of a “moral chemistry which rarifies,
distils, evaporates, and compounds virtues, till they change their nature and become vices.”69
Even more prominent were fears about the sexualized language of botany, which conservatives
referred as the study of “Jacobin plants.”70

Associations between science and sexual immorality were a typical feature of conservative
rhetoric, wherein radical philosophy was linked to sexual promiscuity, and sexual promiscuity
was in turn linked to the weakening of the family unit, which publications like The Anti-Jacobin
Review insisted was essential to “the welfare of the state.”71 The same article, a review of
Godwin’s Memoirs of Mrs. Wollstonecraft [sic] (1798), tellingly denounces Godwin’s politics in
almost orgiastic terms, claiming that “leaving women to the exercise of what he calls their
natural and social rights […] would take away powerful restraints on the promiscuous
intercourse of the sexes.”72 This “promiscuous intercourse,” the review argues, “has a very direct
and speedy tendency to the annihilation of virtuous principles, and consequently to the
advancement of Jacobin morals.”73 Similarly, the Review chastises Wollstonecraft’s novel Mary
(1788) for “describ[ing] the promiscuous intercourse of the sexes, as one of the highest

70 See for example, Alan Bewell, “‘Jacobin Plants’: Botany as Social Theory in the 1790s,” The Wordsworth Circle 20.3
71 “Memoirs of Mrs. Wollstonecraft,” Anti-Jacobin Review (1798), 100.
72 “Memoirs of Mrs. Wollstonecraft,” 100.
73 “Memoirs of Mrs. Wollstonecraft,” 100.
improvements to result from political justice.”

Even in its favorable reviews, the magazine’s sexualized language betrays an anxiety about how readily women may find themselves beguiled by new forms of learning. Hannah More’s *Strictures on Female Education* receives an otherwise glowing review, but the author cautions that “we must not, however, pass over wholly without notice page 297, where our author, somewhat too hastily, commences commentary; and seduced, as it would seem, by her natural partiality towards everything that appears to be ingenious” (original emphasis).

*Modern Philosophers* is similarly preoccupied with the notion of new political philosophies as instruments of seduction that undermine the wellbeing of the state.

The modern philosophers’ most egregious affronts to familial stability are voiced in their repeated citation of François Le Vaillant’s ostensibly scientific *Travels from the Cape of Good Hope* (1790). A dilettante collector, ethnographer, and naturalist, Le Vaillant’s anecdotal account of his travels remained tremendously popular for several decades. Though it is more subjective and novelistic than most academic travelogues, “Le Vaillant claimed scientific authority, and his contributions were esteemed as such by contemporaries.” Hamilton’s modern philosophers latch onto Le Vaillant’s ethnographic account of the so-called Hottentot population of modern day South Africa, and are especially drawn to what they perceive as the Hottentots’ sexual freedom and indifference to the conventional European family structure. Mr. Glib enthusiastically declares them “a whole nation of philosophers,” exalting the promiscuity of a culture wherein a man may “[exert] his energies as he pleases! Take a wife today: leave her tomorrow!” (141). Hamilton thus uses the philosophers’ veneration of the Hottentots as a stark example of the deliberate or irresponsible application of modern ethnographies to political life.

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75 “Strictures on Female Education,” *Anti-Jacobin Review* (1798), 195.


The philosophers perceive a profligacy in the Hottentot culture that exceeds Le Vaillant’s account. To the contrary, *Travels* emphasizes the constancy of Hottentot families, assuring his reader that marriage is “founded on reciprocal inclination […] and] love is their only cement” (142). And, while, polygamy is practiced in some cases, it “is by no means common.” Hamilton is aware that her philosophers are careless in their interpretation of Le Vaillant’s travels, the stated purpose of which to “rectify former errors” in Europe’s understanding of the Hottentot people. Missing this point entirely, the philosophers’ reading of the travelogue invokes early modern associations wherein “Hottentot” was understood to denote cultural degenerations, and the notion of Britain turning into a land of Hottentots was “a commonplace way to express one’s worries that British society was disintegrating.” Hamilton thus suggests that the modern political philosophy of Godwin and others is primitive and backwards looking.

The burlesque philosophers’ selective quotation from Le Vaillant’s work is not necessarily an affront to the *Travels*, as has been asserted, but instead speaks to Hamilton’s mistrust of science as a tool for organizing political society. Grogan reads the novel’s treatment of Le Vaillant as “an uncharacteristically illiberal gesture” on Hamilton’s part, which reiterates “the deeply held cultural biases against which Le Vaillant wrote.” Yet there is nothing uncharacteristic about Hamilton’s sceptical treatment of naturalism. It is consistent with her overarching premise that science may have its value, but is dangerous when applied to domestic society. She demonstrates a sufficient familiarity with Le Vaillant’s book to pull out the most scandalous passages, making it doubtful that she simply missed the book’s stated goal of giving new information about

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78 Le Vaillant, 2: 68.

79 Le Vaillant, 2: 72

80 Le Vaillant, 1:xxiii.


hitherto unexplored (at least for Europeans) regions of Africa. Hamilton carefully selects passages from Le Vaillant’s work that demonstrates the Hottentots’ foreign family structures, but the passages themselves do not argue for such structures in England. Instead, Hamilton’s philosophers project their own warped values onto Le Vaillant’s politically innocuous text. As with other scientific endeavours in *Modern Philosophers*, Le Vaillant’s *Travels* provides occasion for criticism, while never being directly subject to it. She does not satirize Le Vaillant’s ethnography so much as she satirizes those who would bend the text to suit their own selfish desires. What seems a prolonged attack on Le Vaillant’s *Travels* then is rather an extension of her larger project to stave off the dangers that fashionable knowledge might pose to traditional hierarchies.

5. Vital Energies and Radical Science

*Modern Philosophers* was not alone in its apprehensions about fashionable knowledge. In the 1790’s, scientific innovation was often explicitly linked with political innovation, reform, and revolution. Thomas Beddoes’s *Observations on the Nature and Cure of Calculus* (1793), for instance, draws clear connections between political and scientific progress, declaring that “now, when the human mind seems, in so many countries, about to be roused from that torpor, by which it has been so long benumbed, we may reasonably indulge the expectation of a rapid progress in this, the most beneficial of all sciences [i.e., chemical medicine].” As with so many British liberals, Beddoes quickly became disillusioned with the French Revolution. Yet his detractors, and detractors of revolutionary science more generally, continued to associate Beddoes’s optimism for the scientific improvement of mankind, with the upheavals in France. The anonymous poem “The Golden Age” (1794), for instance, facetiously praises “BEDDOES, the philosophic Chymist’s Guide,/ The Bigot’s Scourge, of Democrats the Pride.”

83 Le Vaillant, 1:xxiii.


goes on to implicate Beddoes in the revolutionary violence when the speaker mockingly laments his inability to stir the mob in a bloody pursuit of scientific enlightenment: “Oh had I, silly swain, the force and fire/ Of some, whom Frenchmen’s bloody deeds inspire [. . .] To Disperse the darkness of primæval Night,/ And bid a new Creation rise to light!”86

While Beddoes’s sympathies for French Jacobins were overstated for rhetorical convenience, the same cannot be said of political reformer John Thelwall, who unmistakably ties empirical science to the Revolutionary project of the French and English middle classes. Thelwall’s political treatise, Rights of Nature (1796), invokes Bacon’s experimental methodology in the work’s natural history of political society. Rights of Nature draws heavily from naturalistic principles in its case for radical political reform, declaring, for instance, that “Jacobinism […] (like all other systems) is to be tried by reference to the first principles of nature.”87 Thelwall extolls the “middle classes of society” (his own and those of the past) for their “promot[ion] of moral and intellectual improvement” in the face of aristocratic idleness.88 But while Beddoes, Thelwall, and others were making use of broad concepts like scientific innovation and systems of nature to further their political ends, the even more inflammatory concept of “vital nature” had taken hold in scientific circles.

The concept of vital energy as an animating force dates back at least to the thirteenth century, as when Chaucer writes of the fallen knight Palamon, whose “vital strenthe is lost and all gone.”89 By the middle of the eighteenth century, however, a number of important scientific texts—Georges-Louis Leclerc de Buffon’s Histoire naturelle général et particulière (1749) foremost among them—signalled a new way of conceiving vital energy.90 Where the mechanist view of

86 Anonymous, Golden Age, 4,5.


88 Thelwall, 2: 98.


90 For a detailed explanation of the eighteenth-century transition from “mechanism” to “vitalism” see Peter Hanns Reill, Vitalizing Nature in the Enlightenment (Berkeley: University of California Press, 2005), especially “Storming ‘the Temple of Error,’” 33-70.
nature, championed by Isaac Newton and his contemporaries, required a divine intervening force to create and propel life, the emerging notion of vitalism envisioned life as non-mechanical, “a force or power specific to and located in living bodies.” The imaginative possibilities of this newly vitalized nature permeated all areas of knowledge, intertwining discourses in literature, science, and social philosophy among others. The notion of autonomous matter became a powerful concept for reformists. By the end of the century, the language of vitality had become a mainstay of those eager to rethink political society, and soon too their critics. So ubiquitous was the concept that by the 1790’s, “invocations of innate ‘energies’ in man or nature became both a byword of Jacobinism and, perhaps unwittingly […] their loyalist opponents.” The proposed existence of vital energy was a powerful tool because, its proponents claimed, it offered proof that nature itself was non-hierarchical, and antithetical to manmade structures of aristocratic and monarchical authority.

At the discursive nexus between empiricism and political philosophy was the pseudo-scientific language of “energy,” which both radicals and their conservative adversaries regularly employed as a short-hand for middle-class ambition. Thus the broad and imprecise language of “energy” becomes a primary target for Modern Philosophers’ burlesque of those who would invoke faddish science to justify their destabilizing ambitions. Ted Underwood’s comprehensive examination of the cultural history of energy finds that the word spikes in the late eighteenth century in popular social and scientific discussions, functioning as a new way of conceiving labour power and class relations. While “energy” was not much used in technical publications, even those of Priestley and Erasmus Darwin, those with whom it was most closely associated, it had by the 1790’s become argot for reformers such as Godwin, who sought to apply naturalistic principles to political society, and an easy target for the conservative satires of Hamilton and others. According to Underwood, poets and philosophers of the Romantic period utilized the concept of


92 Packham, 7.

energy to draw an analogy between the productive powers of nature and the productive labour of human society. For a brief period in the late eighteenth century, particularly between the French Revolution and the Terror that followed, “energy was a code word for middle-class radicals’ faith in the talent and activity of their own class.” Conversely, the concept was frequently parodied in anti-Jacobin literature as linking “the Godwinian tenet of ‘perfectability’ to overweening middle-class ambition.” In this context, merely invoking the concept of energy might count as an admonishment of radical politics.

Underwood’s assessment is compelling, though it perhaps oversimplifies Hamilton’s discomfort with middle-class autonomy. Modern Philosophers does indeed satirize immoderate ambition and social pretension; however, the novel betrays an ambivalence about the nature of England’s middle class that would endure throughout Hamilton’s writing. As Underwood argues, late-eighteenth-century analogies between labour and natural energies were deeply implicated in emerging forms of class struggle. Such analogies were instrumental in naturalizing the language of class, which “sorted individuals according to their mode of producing or consuming economic value,” and displacing hereditary notions of “rank,” “order,” and “estate.” Thus the language of energy, which Hamilton’s titular philosophers throw around with abandon, was fundamentally intertwined with new conceptual possibilities for social progress.

The Godwinian Mr. Glib is insistent in his refrain that “energies do all.” If harnessed properly, he tells his disciples, energies can cure animal bites (49), mend bones (159), and even make short people taller (219). Yet these absurd properties are merely quixotic. Hamilton reveals the real danger of such conceptions is the language they provide to justify evading the types of domestic virtues that were coming to define the middle class, including modesty, sympathy, and

94 Underwood, “Productivism,” 103.
95 Underwood, Work, 5.
96 Underwood, Work, 48.
97 Underwood, Work, 3.
temperance, as well as the economic virtues, particularly a strong work ethic. In other words, *Modern Philosophers* burlesques the concept of energy in order to demonstrate the threat it poses to the segment of society most likely to invoke it.

The degeneration of the middle class was a topic of concern for Hamilton. Her *Letters on the Elementary Principles of Education* (1801), for instance, laments the contempt with which Britain seems to hold “the middle classes of her children,” which were once considered “the glory and strength of the nation.” The shopkeeper, Mr. Myope, latches onto the concept of energies precisely because it allows him to avoid actually expending energy minding his shop. In a typically ironic moment, he extols the modern philosophy of vitalism, declaring “mechanical and daily labour to be the deadliest foe to all that is great and admirable in the human mind” (142-143). And while Glib and his coterie generally seem convinced about the panacean properties of human energy, none are above taking liberties in order to avoid inconvenient responsibilities, as when Glib dodges a financial debt to Bridgetina, blithely declaring “Damps my energies to see a creditor. Preserve your energies, my dear. That’s it! Energies do all!” (323). Thus Glib and his disciples dramatize the dire predictions about the middle classes that Hamilton voices in her *Principles of Education* and elsewhere. Her concern, however, is not their rise, but rather their decline, which she envisions as an inevitable result of “luxurious habits and dependent fortunes.” These are, of course, the precise vices that her modern philosophers rationalize through their pseudo-scientific discourses of energy.

The philosophers’ burlesque attitude towards the “energetic” labour of middle-class radicalism gestures towards a key problem in *Modern Philosophers*, the question of what kind of labour was appropriate for an emergent class that simultaneously defined itself against the idleness of the aristocracy and the toil of the peasantry. While *Principles of Education* defends middle-class virtue, nowhere in *Modern Philosophers* is Hamilton able to envision a virtuous model for


100 Hamilton, *Education*, 349.
middle class economics. Rather, she rebuts the Godwinian disdain for “mechanical daily labour” by transforming it into a providential virtue, as depicted in an idyllic episode involving rural haymakers. As the good Christian Mrs. Martha observes, “It is one of the blessings belonging to a life of labour, to be exempted from the disquietude of fancied ills” (107). At the same time, Hamilton scorns the non-laborious work of urban capitalists, through her unflattering depiction of Sir Anthony Aldgate, a proto-Dickensian miser who works out of a dingy office accruing wealth off the labour of his underpaid employees, and having “no idea of any comfort but that of accumulation” (304). Ironically, this is the very sort of work performed by the custodians of Henry Sydney’s small trust fund that expanded it to a modest fortune of “one thousand pounds a year, independent of his profession” (352). This previously unrealized fortune in turn provides Henry the means to retire back into the country where his medical practice takes on a markedly paternalistic character. As one elderly haymaker tells Bridgetina, who suggests he may be too old to work, “I would go ten miles at midnight upon my bare feet to serve young Mr. Sydney there, who saved my poor Tommy’s life in the smallpox” (106). Thus, Henry’s ostensibly middle class profession more closely resembles an older, aristocratic, model of mutual obligation.

The novel has the same problem finding an appropriate social space for middle-class economics as it has finding an appropriate social space for science. While Hamilton seems to recognize its merit, she cannot imagine a space for practical innovation. Indeed, Modern Philosophers shows scientific innovation to be detrimental to the bucolic labour of the haymakers, “many [of whom] found employment here who would have been rejected by more scientific farmers” (105). This conflicted attitude is exemplified in a theological discussion between Mrs. Martha and Dr. Orwell, wherein Mrs. Martha proposes a rejection of “abstruse and speculative points of doctrine, and confine themselves to those which are chiefly insisted upon in the discourses of our Saviour” (104). Dr. Orwell agrees, but laments the “confession of charity and brotherly love would be justly deemed an innovation with big alarm” (104). The intended irony, of course, is that the notion of following Christ’s teachings is anything but “an innovation.” Yet there is a second, unintended, irony in that the novel’s answer to nearly every instance of innovation, be it technical, social, or economic, is to abandon it. Tellingly, one of the final images of the novel is Mr. Churchill’s museum of natural history falling into disuse. Since Churchill’s granddaughter
Maria “had been able to lisp the name of grand-papa,” and his grandson, “Harry Sydney to climb upon his knee, the beetles and butterflies have been frequently neglected” (388). This sentimental picture of Churchill and his grandchildren is also a key political image for Hamilton and other social conservatives. The final chapter of the novel repeatedly endorses a life of retired domesticity as a kind of inoculation against intertwined religious and political enthusiasm, which she sees as leading to revolutionary politics.

6. Progress without Progress

In 1791, a patriotic mob torched Priestley’s laboratory chanting “No philosophers—Church and King forever!”¹⁰¹ By the end of the eighteenth century, then, large segments of the populace finally seemed to grasp what satirists had been gesturing towards since the first days of the Royal Society, that scientific innovation presented a threat to political authority. Priestley’s “factious airs” offered a non-hierarchical vision of nature and a model of dynamism that transitioned easily to the political realm. But the hierarchy did not visibly tremble at the air-pump as Priestley imagined. Instead, conservatives, like Burke and William Pitt, annexed the metaphor in denouncing the “effervescence” of revolutionaries.¹⁰² Such appropriations were common among conservatives, but they were, at best, a stopgap to discourses framing political progress as a matter of science. If the destruction of Priestley’s laboratory was a symbolic attack on science-as-politics, it can equally be regarded as symbolic of the futility of such attacks, since science and political reform both continue largely unimpeded.

Hamilton, like the satirists before her, intuited a larger problem—which eluded Burke, Pitt, and other anti-Jacobins—that scientific and social progress had sprouted from a common seed. There is a playful truism among many social historians that “the middle class is always rising.”¹⁰³ This notion that the middle class is defined by perpetual advancement is equally applicable to science.


¹⁰² Lewis, 197.

Middle-class ascension (which implies, among other things, the growth of industrial and investment economies) cannot be divorced from scientific progress, since both developed from a common culture of innovation, which had been growing since the time of the Restoration. Few conservatives fully appreciated this interconnection, perhaps not even Hamilton, at least not consciously. Yet *Modern Philosophers* registers a clear understanding that scientific and political innovation could never be fully divorced, and no branch of science was fundamentally less destabilizing than any other. It is for this reason that the novel disparages every aspect of natural science no matter how benign.

Miriam Wallace generously recognizes a positive philosophy in the novel’s final instructions for how to live a happy life, when the narrator enjoins the reader to “seek for it in the right path of regulated desires, social affections, active benevolence, humility, sincerity, and a lively dependence on the Divine favour and protection” (389). Yet this is hardly more than a string of platitudes and an unsatisfying resolution for such a political work. In keeping with the novel’s aversion to scientific-political innovation, we might rather find the moral in the poetic fragment upon which the novel closes, extolling the merit of “an elegant sufficiency, content/ in Retirement, [and] rural quiet” (389). The excerpt becomes surprisingly poignant in the context of a book that so consistently resists scientific innovation for fear of its political implications. The only form of progress that *Modern Philosophers* can ultimately endorse is the “progressive virtue” in deference to an “approving Heav’n!” (389). In other words, the novel implies, progress is to be desired, so long as it is not progressive.

104 Wallace, 245.


Conclusion

This dissertation begins with an account of Victor Frankenstein’s introduction to science at university in Ingolstadt, but his passion for natural philosophy begins somewhat earlier. As a young man of about fifteen years old, he “witnessed a most violent and terrible thunder-storm.” As he recounts, “the thunder burst at once with frightful loudness from various quarters of the heavens,” causing “a stream of fire [to] issue from an old and beautiful oak,” which “was not splintered by the shock, but entirely reduced to thin ribbands of wood” (23). “The catastrophe of this tree” sparks a passion in him to learn “the nature and origin of thunder and lightning,” and “the various effects of this power” (24). From this early scene, *Frankenstein* intertwines scientific knowledge with cataclysmic power. And, as the novel asserts, the immoderate “pursuit of knowledge” that sets Frankenstein on his ruinous course stemmed from the same depraved human ambition that led to the enslavement of Greece and the decimation of Mexico and Peru (34). What makes these associations so significant is that Mary Shelley appears to take the destructive potential of science seriously. We thus see in Frankenstein a new kind of literary scientist, one whose potent arts stand in stark contrast with the petty tinkering of socially ambitious projectors like Nicholas Gimcrack.

It does not quite go without saying that *Frankenstein* is a parable about the consequences of scientific ambition. The novel is deliberately cagey about “the instruments of life” that occupy Frankenstein’s laboratory, and Shelley never elucidates the nature of that “spark of being” that animates his monster (35). Well into the twentieth century, the majority of critics ignored, denied, or at least minimized, the novel’s scientific underpinnings. James Rieger’s introduction to the reprint of the 1818 edition acknowledges that Shelley “knew something of Sir Humphry Davy’s chemistry, Erasmus Darwin’s botany, and, perhaps, Galvani’s physics,” but claims that Frankenstein’s science is, rather, “switched-on chemistry, souped-up alchemy, [and] the electrification of Agrippa and Paracelsus.” However, subsequent work by the likes of Samuel

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Holmes Vasbinder, Marilyn Butler, and Anne K. Mellor has rendered such an adamant stance untenable. Still, there remains some debate as to how scientific Frankenstein’s science actually is, and many scholars prefer to approach him primarily as an occultist. David Ketterer’s study of the novel’s manuscript history compromises in asserting that it was originally intended as a “gothic, supernatural, Faustian, ‘orientalist,’ ‘ghost story,’” that developed into Shelley’s “more rational and scientific conception.” Ulf Houe’s recent article on electricity in the novel more adamantly contends that images of Frankenstein as a scientist—which mainly emerged out of twentieth-century cinema—distract from the novel’s metaphysical exploration into the nature of humanity. But, while Shelley may have intended to blur the lines between mysticism and science, Victor’s formal study of “natural philosophy and particularly chemistry” clearly establishes him as a man of science.

Yet Frankenstein is a drastic departure from the literary men of science who preceded him, which explains why critics are more inclined to trace his lineage to mystics like Faust and Merlin than they are to eighteenth-century virtuosi. A few scholars have proposed that Frankenstein ought to be read as a satire on the deficiencies of science. Patrick J. Callahan takes the novel’s Miltonic flourishes as sardonic commentary upon the progressivist ethos of Enlightenment science. And Philip Stevick, though not concerned with earlier satire, incidentally points to common features between the bungling science of Frankenstein and the burlesque natural philosophers of the previous century. Frankenstein lends itself to satire, Stevick argues, because it is essentially a


chronicle of Victor’s failures, beginning in Ingolstadt when “the poor fool” is berated for having given “years of his life to the wrong books.” There is indeed a hint of absurdity in the fact that Frankenstein obsessively toils over his golem, all the while revolted by his “filthy creation” and “loathsome” employment (34); similarly absurd, it is only when the monster awakens on that dreary November night that Victor seems to notice that he inexplicably assembled a creature eight feet tall with skin too tight for its frame (35). Such instances, Stevick asserts, intentionally depict Victor as a failure, “not in a grand and tragic manner but in a manner closer to low comedy, bumbling, inattentive, inept, and ineffectual.” However, these passages are better regarded as examples of dark irony than of “low comedy,” and readings of this sort labour to find humour in a relentlessly serious book. Indeed, Frankenstein’s dour tone is one of its remarkable features. The gravity with which the novel treats science says much about shifting cultural attitudes.

This is not to claim Frankenstein is representative of Romantic-era literature. Shelley had a unique perspective and authorial voice, and many people agree with the writer Brian Aldiss when he claims that hers was the first genuine science fiction novel. For all her independence of mind, however, and prescience as a writer on science, we can nevertheless see Frankenstein as exemplifying a moment of cultural change. By 1818, the innovative spirit of science had entrenched itself in British society, and literature could begin to take scientists seriously.


9 Stevick, 225.

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