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MAKING KNOWLEDGE WITH SCIENCE AND LITERATURE

Joseph Drury

The Experimental Imagination: Literary Knowledge and Science in the British Enlightenment by Tita Chico. Stanford, CA: Stanford University Press, 2018. 256 pp. Hardcover \$60.00, paper \$26.00.

What does science owe to literature? This has been a big question for literary studies ever since the mid-1980s, when Steven Shapin and Simon Schaffer proposed that seventeenth-century efforts to establish the authority of the scientific method depended on the “literary technology” of the experimental report as much as material ones such as the air pump and the microscope. In recent years, studies by John Bender, Al Coppola, Courtney Weiss Smith, and Helen Thompson, among others, have sought to build on—and sometimes significantly modify—this provocative thesis by exploring, on the one hand, the literary forms and devices that early scientists used to advance new theories about the natural world and, on the other, the way poets, dramatists, and novelists responded to the new ideas and methods of the Enlightenment’s natural philosophers. Tita Chico’s *The Experimental Imagination: Literary Knowledge and Science in the British Enlightenment* is a valuable addition to this project, which synthesizes many of its key insights while providing a concise, wide-ranging overview of the various entanglements of literature and science in the period.

Chico begins by identifying four of the key types of imaginative work involved in the production of scientific knowledge. In the broader socio-cultural context, science functioned as what

she calls a “trope”: long before it had proven its social or economic value, “experimental philosophy connoted a sense of modernity” (23). Purchasing a microscope or attending a course of scientific lectures were forms of self-fashioning that allowed British men and (increasingly) women to present themselves as sophisticated, forward-thinking, and enlightened. But the public was also required to undertake imaginative labor at the more fundamental, constitutive level of experimental practices and protocols. The validity of an experiment depended on textual representations that turned readers into “virtual witnesses” able to imagine the events described as clearly as if they had seen them in person. Although the Royal Society insisted its publications be written in a plain style and warned against unnecessary rhetorical ornamentation, Robert Boyle and other early members recognized that vivid similes and metaphors were crucial resources when it came to explaining the unfamiliar, sometimes invisible, physical phenomena revealed by their experiments. Likewise, one might think that the collection of “observed particulars” on which empirical theories about nature were to be founded would leave little room for the imagination, but Chico uses the example of Robert Hooke’s microscopy to show that deciding what natural phenomena counted as significant

or examining an object from multiple different angles to determine its “true appearance” (33) involved a process of selection and comparison not all that different from the work of finding the right metaphor or simile. Finally, Chico makes the point that the credibility of the experimentalist’s claims depended on his rhetorical self-presentation as a “modest witness” imbued with an ethos of gentlemanly self-restraint that served to erase his subject position from the experimental scene and make him seem as passive an instrument of knowledge production as the apparatus he operated. But she also notes the contradictory expectation that the philosopher “transmit enthusiasm” (40) for the experimental project as a whole by adopting an affective register of wonder and delight towards the divinely ordained marvels to which he drew his readers’ attention.

Thereafter Chico looks at the way a series of texts that we might think of as more obviously “literary” responded to the new science’s epistemological retooling of the imagination. In one especially engaging chapter, she locates the origins of the popular subgenre inaugurated by Bernard de Fontenelle’s *Conversations on the Plurality of Worlds* (1686) in contemporary figurative constructions of scientific practice as “an erotic, seductive plot involving a masculinized experimentalist aspiring

to dominate a feminized nature” (77). Though a Frenchman and a Cartesian, Fontenelle belongs in a book about the British experimental imagination because of the popularity of Aphra Behn’s translation of the *Conversations*, revised and reprinted throughout the eighteenth century, and because of the countless imitations it inspired that updated the science while preserving the basic template of a philosophical older man initiating a curious younger woman, with varying degrees of erotic subtext, into the mysteries of modern physics. Works such as Francesco Algarotti’s *Newtonianism for the Ladies* (1737), translated into English by Elizabeth Carter, made science sexy.

Elsewhere, however, Chico shows how satirists latched on to the imaginative aspects of the new science to ridicule what they saw as the immodesty of the experimental philosophers’ pretensions to epistemological and cultural authority. The “bad scientists” (74) that crop up periodically in late seventeenth- and early eighteenth-century comedy—Sir Nicholas Gimcrack in Thomas Shadwell’s *The Virtuoso* (1676), for example, or Lady Science in James Miller’s *The Humours of Oxford* (1730)—adopt the rhetoric of disinterested curiosity and enlightened benevolence, but soon reveal themselves to be ludicrously libidinous, grasping, or self-serving, while their enthusiasm for experimental

philosophy is shown to be nothing more than a shallow project of self-aggrandizement. As Chico shrewdly observes, Susannah Centlivre puts an intriguing spin on this formula in *The Basset Table* (1705) by turning the self-interest of the female virtuoso Valeria into a form of feminist self-empowerment. By “transforming her dressing room into a laboratory” (60) and showing more interest in her specimens than her lover, Chico argues, Valeria is able “to imagine her own self-determination” (59). It is a compelling argument, even if Chico misses a trick by neglecting Valeria’s role as a foil for her cousin, the flirtatious Lady Reveller, whose taste for high-stakes gambling makes Valeria’s scientific interests seem far less subversive of the patriarchy by comparison—especially since the final part of the chapter argues for the figure of the reformed coquette in Eliza Haywood’s *The Female Spectator* (1748–9) as the basis for a new form of “enlightened subjectivity” (64).

In a later chapter Chico turns to the skeptical critiques of the utopian political ideology advanced by the early experimentalists. If the Royal Society’s first historian, Thomas Sprat, sought to present it as a model of civil government with an exemplary commitment to “social improvement,” “sober debate,” and “obedient” yet “manly” (107) submission to authority, Chico shows that some of his contemporaries took

a rather different view. Margaret Cavendish, duchess of Newcastle, drew on her doubly marginal position as both a woman (she was the first to attend a meeting of the Royal Society, and the last until the twentieth century) and an ardent royalist and absolutist to question the value of experimental philosophy as a means of securing either reliable knowledge or peace and prosperity. In her *Observations upon Experimental Philosophy* (1666), as well as in *The Blazing World*, the delightfully bizarre work of fiction she appended to it, Cavendish challenged the imaginative leaps of Hooke's microscopy, claiming that sensory perception was subjective and prone to errors and that even the most reliable observed particulars could not improve a "stupid mind" (113). Encouraging experimental philosophers to share their ideas freely was in her view, Chico notes, likely to lead not to social progress but to an "unstable, fractious body politic" (117). Cavendish suggests her solution to this problem when she has the Empress of the Blazing World bring experimental science and technology under the control of the absolutist state in order to overawe her subjects and enslave other nations, an episode that Chico thinks makes Cavendish's view of experimental philosophy seem "contradictory" (117–18). But one could perhaps

argue that the Empress's exercise of her absolute sovereign power is understood to guarantee the practical utility and authority of knowledge that the free but disputatious experimentalists had left speculative and uncertain. Cavendish's sense of the ease with which experimental science might be made to serve imperial interests is thus not so different from Swift's in *Gulliver's Travels* (1726), as Chico herself observes. Swift broke off from writing *Gulliver's Travels* to pen a series of pamphlets attacking the British government's ill-conceived attempt to fix the Irish currency crisis by replacing their silver halfpennies with copper ones that were widely suspected of being debased or even counterfeited. Newton's role in this project—as Warden of the Royal Mint he authorized the assay of the new copper coins—helped convince Swift that "natural philosophy served the interests of capital accumulation and imperialist government" (127) rather than the ordinary people of Ireland. Chico argues that this conviction informs not only the satire of the Royal Society's experimental program in Gulliver's voyage to Laputa but also, more interestingly, the critique of the experimental principle that "reason is perception" (132) suggested by his encounters with the Houyhnhnms' reductive rationalism.

Much of the conceptual weight of Chico's argument is carried by her notion of "literary knowledge," a coinage that neatly encapsulates the aspect of literary texts that literature and science scholarship is best placed to highlight—namely, their capacity to produce real, valuable knowledge about the world. Chico is an eloquent advocate for the epistemic value of literature, especially when she is analyzing the various forms of "literariness" that natural philosophers made use of to construct and explain their ideas about the world. But she is a little less sure-footed when discussing the kind of knowledge that literariness produces when it is criticizing or satirizing the natural sciences. What is it about fictional plots and characters, for example, that enables Shadwell, Miller, and Centlivre to expose the modest witness as an artificial, rhetorical construction? Chico hints that it has to do with their power to resituate experimental philosophy "within the context of domestic and affective relations" (62)—that is, to make visible again the worldly interests and associations that scientists must conceal in order to make their claims about nature seem objective and universal. But she does not show us any eighteenth-century sources articulating this point the way she does, say, when illustrating Boyle's understanding of metaphor or Fontenelle's use of the seduction plot, nor does she relate it to any of

the recent work on the epistemology of fictionality by Catherine Gallagher, Jesse Molesworth, or Sarah Tindal Kareem.

Chico also argues here and elsewhere that literary knowledge is shown to be "superior" (46) to science because it is able to go "beyond the material" (134). But this hierarchical model of the relation between literature and science implies a set of idealist, even Kantian, epistemological assumptions that are never theorized or made explicit. What makes the knowledge of human subjectivity and social interaction that seems to be the special preserve of fictional narratives—"moral" knowledge, as it was called in the period—superior to the knowledge of physical nature derived from experimental science? Is scientific knowledge necessarily devalued by the revelation that it is produced by flawed human beings with their own interests and agendas? Shadwell may have thought so, but did Centlivre? And is this a position we would want to endorse today in an age of anti-vaxx movements and climate denialism? Similar questions might be asked about the final chapter, in which Chico examines the emergence of aesthetics out of and in response to the natural sciences via readings of Alexander Pope's *The Rape of the Lock* (1717) and James Thomson's *The Seasons* (1730). Does the power of poetry to expose the limits of mere perception and the dialectical

relation between observed particulars and theorized generalizations really diminish the value of scientific knowledge? Couldn't we say, less polemically, that literary texts promote the kind of self-reflexivity about the social conditions and limits of scientific knowledge that feminist science studies scholars such as Sandra Harding and Donna Haraway have in mind when they argue for "strong objectivity?" In such a model, literature's relation to science would be critical, certainly, but complementary and collaborative rather than competitive or hierarchical. Indeed, this is the model that Chico herself seems to suggest when she notes the unexpected affinities between the

modest witness of natural philosophy and the "disinterested spectator" (140) theorized in the work of early aesthetic philosophers such as the Earl of Shaftesbury and Francis Hutcheson. Nonetheless, in an era of dwindling majors and vanishing jobs, literary studies needs its boosters, and Chico's book, even if it sometimes overshoots, makes a compelling case for the distinctive quality and historical importance of literature as a source of knowledge about the world.

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