Introduction

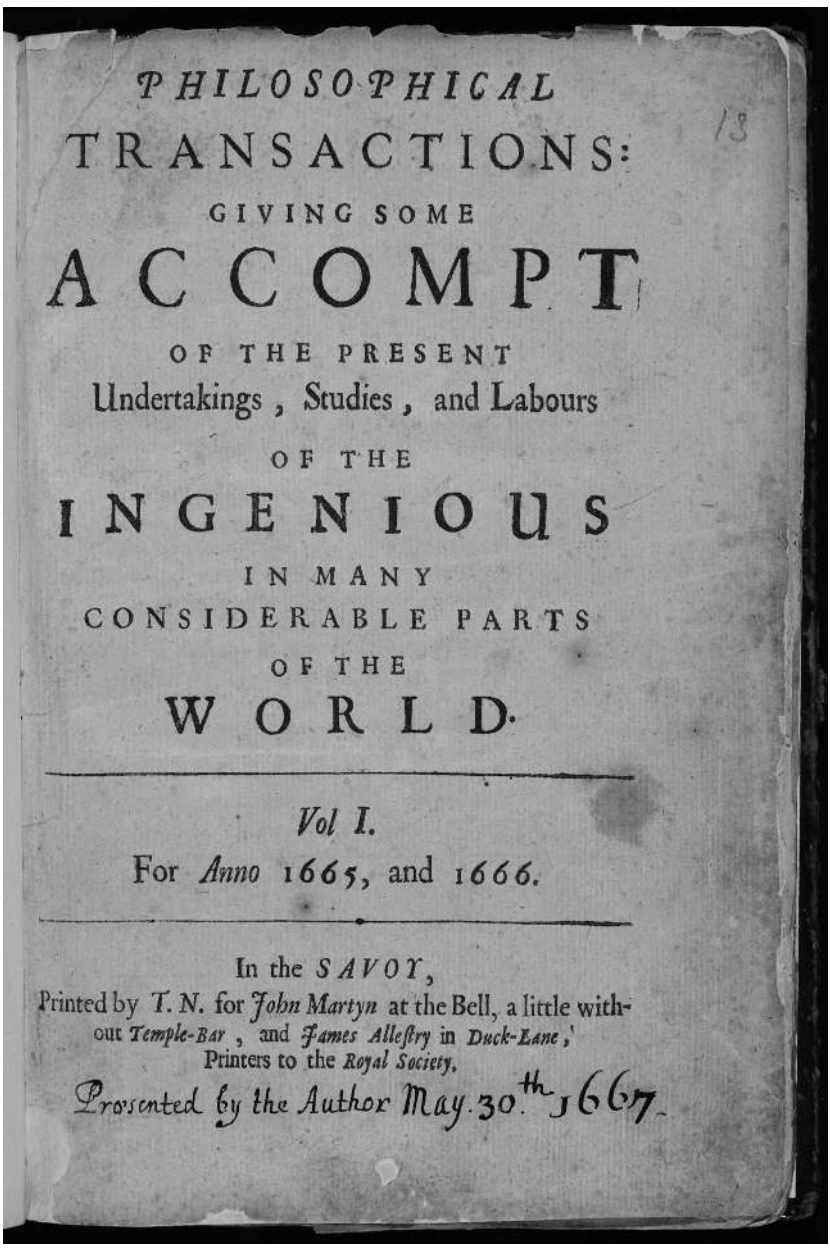
This Element examines the eighteenth-century British novel's contributions to empirical knowledge, or how we move from observations to generalizations. It's a deceptive topic because it slips easily between literary history and philosophy. It's also a familiar topic in the study of the novel, particularly of novelistic realism. Since Ian Watt's influential and enduring *The Rise of the Novel*, scholars of literature have addressed questions of knowledge in the eighteenth-century novel largely through the rubric of what Watt calls "formal realism," which is not "the kind of life" the novel presents, but "the way it presents it" (Watt, 2001, p. 11). Not everyone agrees with Watt's central thesis that "the novel raises more sharply than any other literary form" "the problem of correspondence between the literary work and the reality which it imitates," but even Watt's critics tend to understand the relationship between the novel and empirical knowledge as a matter of the epistemic problem of correspondence plus the formal problem of representation (Watt, 2001, p. 11). The central claim of this Element is that the eighteenth-century novel made its most dynamic and enduring contributions to empirical knowledge not through formal strategies of representation, but as a training ground for inductive reasoning.

Modern disciplinary divisions have shaped our understanding of the eighteenth-century British novel's impact on empirical knowledge, often in limiting ways. Philosophers address relationships between truth and fiction or aesthetics and propositional knowledge, often drawing examples from fiction, but not typically from eighteenth-century fiction. Philosophy of fiction is part of the broader subfield of aesthetics, and philosophers of fiction tend to agree with literature scholars that eighteenth-century literature is not aesthetically exemplary of what today we consider literature (this is a euphemistic way of saying that even literature scholars tend to turn up their noses at eighteenth-century fiction, while philosophers draw the bulk of their examples from the more celebrated literary traditions: classical Greek and Roman, nineteenth-century British, US, and Russian literatures, and of course Shakespeare). Meanwhile, historians of philosophy chart developments in eighteenth-century theories of knowledge in the work of figures canonized as philosophers – Francis Bacon, Rene Descartes, John Locke, David Hume, and the like – without accounting for the philosophical contributions of other genres of writing in the period, a period that predates the division of writing into "literature" and "philosophy." One unfortunate side effect of the disciplinary division between literary studies (concerned more with form and representation than with knowledge) and history of philosophy (concerned with "philosophy" as a retroactively identified genre that largely excludes novelistic

fiction when not written by authors since canonized as "philosophers") is that the philosophical contributions of women, working primarily in the medium of novelistic fiction, go under-recognized in the history of Enlightenment philosophy (I explain more about this later).

As a consequence of the structural gap between literary studies and philosophy, literature scholars have largely confined ourselves to addressing the relationship between fiction and knowledge through the back door of novelistic realism, reducing epistemic matters to matters of form and representation. The purpose of this Element is to account for the structural gap between literary history and philosophy that leads scholars to understand the question of empirical knowledge in the eighteenth-century novel as a question of realism, where realism equals the problem of correspondence plus the problem of representation. What's missing from this equation hides in plain sight: reasoning, specifically systems of inference. In other words, what's missing from the abundance of writing on empirical knowledge in the eighteenth-century novel is how the novel illustrates and embodies systems of thought, or what happens between observation or representation and justified true belief.

Accordingly, to adopt realism as the primary framework for this topic would be to limit this study in precisely the ways I aim to correct. What Karin Kukkonen calls "the curse of realism" – the retroactive imposition of the aesthetic standards of nineteenth-century novels on prior novels, such that eighteenth-century novels come to look like failed versions of latter realisms to which they never aspired – is one more reason to move away from realism as a framework for understanding the eighteenth-century novel's contributions to empirical knowledge (Kukkonen, 2019, pp. 9–11). For Kukkonen, Lisa Zunshine, and other scholars working in the field of cognitive literary studies, challenging traditional notions of novelistic realism paved the way for readings of novels that bring evolutionary and cognitive science to bear on novelistic moments of perception. However, this Element is not a study in cognitive poetics, but a study in the philosophy of novelistic fiction. Answering the question of how or whether novelistic strategies of representation achieve a plausible or probable degree of correspondence with the real is important, but it's not enough for knowledge. Empirical systems entail systems of reasoning from observations *or* representations. In an empirical system, knowledge does not follow deductively from observation; empiricism needs induction, a system for drawing general conclusions from specific observations. The eighteenth-century British novel made its most under-appreciated and important contributions to empirical knowledge not through unique strategies for representing the real, but through portrayals of reasoning and thought experiment.


PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

Vol I.
For Anno 1665, and 1666.

In the SAVOY,
Printed by T. N. for John Martyn at the Bell, a little without Temple-Bar, and James Allestry in Duck-Lane,
Printers to the Royal Society.
Prosented by the Author May. 30th 1667.

Figure 1 Henry Oldenburg, frontispiece of the *Philosophical Transactions of the Royal Society*, 1666 (licensed under **CC-BY-4.0**)

Like the study of novelistic realism, the study of seventeenth- and eighteenth-century empiricism, particularly of the Baconian kind and its afterlife in Royal Society writing and experimental practice, has heaped much of the pressure of

justifying knowledge claims on the moment of observation or experience and the objectivity of the observer. However, the widely observed fact that Royal Society scientific atlases rhetorically stressed the clarity and fidelity of pictures over words while relying on verbal descriptions and explanations is evidence that even natural philosophers who were hyper-focused on the fidelity of representation understood the necessity of inference and explanation. Knowledge never simply arrived in the picture, nor did pictures capture the intellection that takes place during and after a sensory experience. As Alex Wragge-Morley writes,

> "naturalists had powerful philosophical motivations for accompanying pictures with verbal descriptions. They did not resort to descriptions simply because their desire to use pictures was thwarted by the high cost of having engraved plates made. They were also motivated by a conception of experience that, in most instances, made the production of pictorial representations that truly resembled their objects impossible"
>
> (Wragge-Morley, 2020, pp. 124–125).

The study of novelistic realism has put a comparable amount of pressure on novelistic representation as the cornerstone of the novel's epistemic success or failure. This makes sense because representation – well beyond questions of epistemology – has always been a central interest in literary studies, at least as central as objectivity has been to the history of the empirical sciences. But representation and objectivity, in their respective disciplinary domains, can carry our understanding of empirical knowledge and the novel only so far. The study of empirical knowledge in the eighteenth-century British novel is due for a revision akin to the one undertaken in the history of early modern natural philosophy. Whereas historians of science have taken greater account of the affective and aesthetic dimensions of early modern ways of knowing, the study of empirical knowledge in the eighteenth-century novel requires an account of novelistic portrayals of reasoning as necessary for empirical knowledge. Novels illustrated not only moments of apprehension or sensory experience, but also what happens after, including how characters process sensory experiences and subsequently move to conclusions about their worlds, about other characters' motives and trustworthiness, and about their own cognitive limitations and biases.

I have suggested that the study of the eighteenth-century novel's contributions to empirical knowledge has been constrained by the rubric of formal realism, even when scholars disagree with Watt's definition of formal realism or his claims about its influence or generic specificity (that is, whether formal

Figure 2 Frontispiece to *The History of the Royal Society of London* (1702 edition) featuring Francis Bacon on the right (Evelyn, 1667)

realism is a property belonging only or especially to the novel genre). Here I'll explain a bit more what I mean by that. Consider two influential, oppositional lines of thought about the eighteenth-century novel and empirical knowledge.

The first is in the vein of Watt's thesis. John Bender observes that eighteenth-century novels "share a way of representing the world and the kind of verisimilitude that Steven Shapin and Simon Schaffer in *Leviathan and the Air-Pump* call 'virtual witnessing' . . . the rhetorical and visual apparatus for communicating scientific experiments to the public and convincing that public of their authenticity" (Bender, 1998, p. 8). For Bender, through verisimilar representations, "fictions, be they hypotheses or novels, yield a provisional reality, an 'as if', that possesses an explanatory power lacking in ordinary experience." It's this fictive, provisional reality from which, as Bender argues, science required separation, or the ability to differentiate between stylistically or representationally similar statements in fiction and in experimental natural philosophy. I'll return to the specifics of Bender's broader argument, but for now I only point out that for Bender, as for Watt, verisimilar "generic traits," produced amid a heightened Enlightenment cultural desire to certify or validate knowledge, mark the novel's special relationship to the development of empirical knowledge (Bender, 1998, p. 9).

The second line of thought is Helen Thompson's critique both of Steven Shapin and Simon Schaffer's claims about the importance of virtual witnessing to Royal Society experimental natural philosophy and of "scholars from Bruno Latour to John Bender," who affirm "the constitutive exclusion of imperceptible causality from the new science" (Thompson, 2016, p. 12). Thompson challenges the "ultimate realist premise" of the first line of thinking:

> The novel, I argue, invokes things that cannot be sensed, things whose power to produce sensation is not mimetically transmitted by sensation itself . . . my account is neither dualist nor Cartesian. Indeed, although *Rise of the Novel* precedes Shapin and Schaffer's exposition of experimental science, a key feature of Watt's realism anticipates their claim for the literal visibility of empirical fact: the "one-to-one correspondence" of referent to reality bars insensible causes from the novel as well as from experiment. My book disputes this "ultimate realist premise" by challenging the dualist presumption that segregates references to mind from references to body. Instead, I argue, eighteenth-century novels make explicit the *production* of sensational understanding as the reader's encounter with forms and powers that enable empirical knowledge. (Thompson, 2016, p. 17)

In conceiving of the novel as a means of representing the qualitative experience of sense perception and of the imperceptible – as opposed to mimetic or verisimilar representation of the real – Thompson demonstrates the shortcomings of the realist theses of Watt and Bender, but *maintains their focus on the novel's formal or representational engagement with the moment of apprehension or perception*, or as Thompson puts it, "the forms, relations, and powers

through which empirical apprehension of reality happens" (Thompson, 2016, p. 11). "The realism that empirical knowledge bequeaths literary history," writes Thompson, "is not mimetic reflection of objects in the world. This realism entails the figures, forms, and experiences through which novels think the contingently produced event of qualitative understanding" (Thompson, 2016, p. 3).

Between the Watt-Bender thesis and the Thompson thesis, we have generative disagreement over the novel's relationship to empirical knowledge. This disagreement both draws on and gives rise to numerous additional accounts of novelistic representation and empirical knowledge in the eighteenth century. But the common focus of even oppositional studies of the topic is the integrity of this formula: the problem of correspondence (verisimilitude) plus the problem of representation (figures, forms). Jonathan Kramnick neatly articulates this focus in a meditation on "Empiricism, Cognitive Science, and the Novel": "To have a mental state is to be in view of a representation, a picture of something one experiences or a series of pictures one puts together, and to be in view of a representation is to be in some relation of greater or lesser accuracy to a world that is being depicted" (Kramnick, 2007, p. 265). Thompson and Natania Meeker, in their introduction to the journal issue that frames Kramnick's article among others, note that "in the eighteenth century, fiction and philosophy substantially intervene in shaping acts of perception, thus constituting and reconstituting experience as materiality" (Thompson and Meeker, 2007, p. 185). I have suggested such a focus makes sense in light of the disciplinary interest of literary studies in matters of representation, but Jonathan Lamb explains another reason for such a focus: the line of thought in Locke, Boyle, Hobbes, and others that takes truth as "a credible representation of what our limited senses allow us to experience" (Lamb, 2007, p. 196). Each of these examples reflects a common way of understanding empirical knowledge in the strict sense of the perceptual and experiential, as a function of the moment of apprehension or sensation and the extent to which it grants us access to the real. This is what scholars typically pick up on in novelistic representation, whether framed as verisimilar (Watt-Bender) or experiential (Thompson-Meeker).

My aim in this Element is not to contest wholesale the vast amount of scholarly work on perception and representation as focal points for explaining the novel's contributions to empirical knowledge. Rather, I claim a negative externality of the momentum generated by interest in perception and representation is that novelistic portrayals of and inducements to processes of reasoning drop out of the equation. This is a problem, because seventeenth- and eighteenth-century empiricists well understood that, representation aside, sense data may be the best basis we have for drawing conclusions, but does not constitute

reliable knowledge in its own right. This is precisely why the forms of Baconian inductive empiricism that would become the dominant theory of knowledge in Britain during the eighteenth century took experiments and experimental technologies as means of countervailing the psychological and cognitive limits – or features, as the case may be – of the human mind.

Accordingly, this Element focuses on how eighteenth-century novels treat reasoning processes. Of course this entails accounts of perception and representation, but not as epistemic ends so much as starting points for what the novel teaches us about methods of inference and justification. As I will show, eighteenth-century writers were adept either at isolating the problems of correspondence and perception to foreground methods of reasoning, or putting so much pressure on the reliability of empirical observation that illustrations of reasoning become the only way out of the forest. In such ways, the novel both evinced and furthered understandings of empirical knowledge projects in the period.

Induction is the primary form of reasoning I address in this Element. I mean induction broadly construed as synthetic reasoning from gathered observations, and for which premises are evidence-based but do not guarantee the truth of the conclusion. The problem of induction concerns, as Ian Hacking puts it, whether "any number of observed instances, short of a complete survey, ever make it reasonable to believe a generalization" (Hacking, 1975, p. 176). The nature, boundaries, and reliability of inductive inference are long-contested, seemingly intractable questions in philosophy, and as such beyond the scope of this study. But that's also why it's worth turning to fiction, and to the eighteenth-century novel in particular, for illustrations of rationales and thought processes that rely on various kinds of inductive leaps. If everyday life – portrayals of which justified theories of the novel as a new and distinct genre for Henry Fielding, Frances Burney, and others – were always or even mostly amenable to deductive reasoning as a practical tool for validating everyday conclusions, then we might not have cause to gather novelistic data of inductive thinking. Alas, as Hume recognized, inductive thinking is both fundamentally flawed and broadly necessary.

Bender offers perhaps the most direct treatment of the role of induction in the novel's contributions to empirical knowledge. He correctly identifies the eighteenth-century British novel as "part of a cultural system that worked to validate Enlightenment canons of knowledge by dynamically linking the realms of science and fiction," but the mechanism Bender identifies for how the novel did so – by "setting [science and fiction] in opposition" – merits further examination. For Bender, "science needs separation of its findings and procedures from the ordinary" and "cannot tolerate the imputation of fictionality," "hence induction emerges as the opposite of hypothesis in scientific method because it attains or seems to attain independence from the fictional" (Bender,

1998, pp. 8–9). This separation of the fictional and inductive makes sense as a heuristic for distinguishing between fiction and hypothesis, but in the case of fiction it is perhaps more about – in Bender's formulation – what "seems." The world of the "as if" in the eighteenth-century novel is not factual even if similar – in its strategies of representation – to how virtual witnessing helped produce matters of scientific fact. However, novels both invite and illustrate inductive inferences, often with a focus on processes of reasoning through the "as if." Many novels – particularly the ones I call novels of data – "present attributes of inductive proof" and "force readers into the position of neutral observers arriving, probabilistically, at judgments based upon the weight of available facts and reasonable inferences," as Bender rightly observes (Bender, 1998, p. 9). But what separates novelistic thought experiment from experimental natural philosophy is neither a strategy of representation nor an inductive *thought* process. It's rather the concept or circumstantial objective of fictionality (as Bender notes), plus the ability to query any truth claims made in fiction by way of an inductive empirical method. In short, induction is fundamental to fiction as well as to natural philosophy. Inductive inference plays an important role in fictional worlds as well as in reality, and in reality – for readers of fiction – by virtue of the former.

In eighteenth-century fiction, portrayals of or inducements to inductive reasoning mainly demonstrated how inductive empiricism might work in the social world, as opposed to investigations of the natural world. This is partially compatible with Bender's understanding of the novelistic mechanism of validating Enlightenment knowledge by setting science and fiction in opposition. As Bender writes:

> The novel, while in the main sharing verisimilar reference with empiricist science, responded to the crisis by abandoning claims to literal, historical fact of the kind Defoe had worked so strenuously to maintain and, by asserting its own manifest fictionality, strove, as Michael McKeon and Catherine Gallagher suggest, toward the representation of higher truths and toward a more intense emotional identification between readers and novelistic fictions. This novelistic occupation of the terrain of fiction then could ground the factuality of experiment in science . . . (Bender, 1998, p. 15).

I say partially compatible because the social focus of novelistic portrayals of induction largely cedes to natural philosophy the epistemic ground of making truth claims about the natural world by means of verisimilar representation and virtual witnessing. What's not compatible between my account of the novel and Bender's here – and McKeon's and Gallaghers's accounts by proxy – is the idea that the novel abandons its positive epistemic function in its pivot toward "representation of higher truths" and "intense emotional identification between readers and novelistic fictions" (Bender, 1998, p. 15).

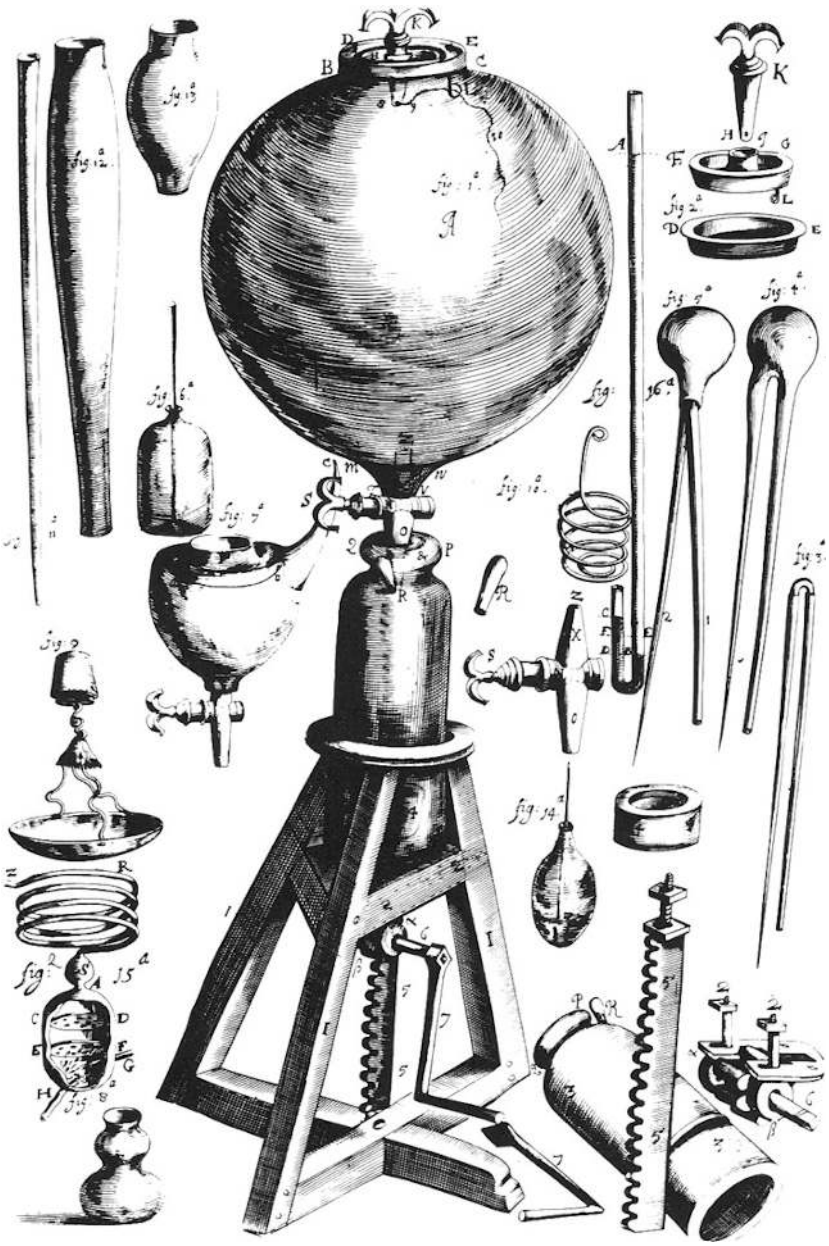


Figure 3 Robert Boyle's air-pump

I suggested earlier that a negative externality of the narrow focus on empiricism in the novel as a function of the problem of correspondence plus the problem of representation is that reasoning drops out of the picture, and this is an example of how that can happen. If we find, as Bender does, that novelistic