

**THE RHETORIC OF PROBABILITY
FROM THE NEW SCIENCE TO COMMON SENSE**

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ABSTRACT OF THE DISSERTATION

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Over the course of the seventeenth and eighteenth centuries, probability, hitherto primarily a quality of rhetoric, expands to become a field of mathematics, a criterion of experimental demonstration, and a guiding principle for the development of the English novel. These applications overlap but are far from coextensive. “The Rhetoric of Probability from the New Science to Common Sense” traces the role of probability, as a fluid concept, in the binding and eventual disassociation of science and fiction during this time. The species of probability generated by fictional narrative is utilized to support empirically indemonstrable hypotheses before and after the rise of experimental culture in the seventeenth century. While the early novel, especially the corpus of Daniel Defoe, has long been spoken of as a fictional imitation of experimental practice, there are significant cases in which fiction is part of the process of experimental demonstration. The exclusively fictional character of the novel later solidifies in the works of Richardson and Fielding as the forms of mathematical and experimental probability developed over the seventeenth and eighteenth centuries are internalized for aesthetic effect.

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Table of Contents

Abstract		ii
Acknowledgements		iii
Introduction	The Polysemy of Probability	1
Chapter One	“I shall prove to you that I see them”: Possible Knowledge, Credible Fiction, and the Uses of Empiricism	16
Chapter Two	The Invisible Laws of Empiricist Fiction: A Case Study in Physic	64
Chapter Three	Projects and the Limits of Probability	113
Chapter Four	Confined Narratives: Probability as a Feature of the Novel	161
Conclusion	The Abuses of Abstraction	210

Introduction: The Polysemy of Probability

“All possible definitions of probability fall short of the actual practice,” warns the mathematician William Feller, and he did not even have in mind as many applications as this study addresses.¹ Historians of science generally agree that the significance of probability within various epistemologies increases in the seventeenth century, while novelists of the eighteenth century explicitly identify probability as the key to their art. To some degree, these groups are using the same word to refer to different ideas, but as this study aims to explain, even when they are referring to the same idea, these developments do not trace a line of progression but a knotting and unknotting whereby literature and science become disassociated rather than contiguous disciplines. The title of this study describes a historical period, roughly from the Copernican revolution through the advent of Common Sense Philosophy or Common Sense Realism in the later eighteenth century. But more significantly, “science” and “common sense” designate dialectical positions corresponding to notions of probability’s sources and utility.

This project began with the presentist assumption that the default or dominant definition of probability, its ideal form, is likelihood, either directly expressible in mathematical terms or abstractly conceivable in such terms. Probability, understood to mean the likelihood of a given thing occurring, is referred to by philosophers of science as “frequentism.” As Brandon Fitelson summarizes, “Ask a scientist what probability is, and one will typically get a frequentist answer: The probability of an event is the relative frequency of trials of a repeatable experiment on which that event occurs; sometimes the words ‘in the long run’ are added.”² There is evidence, across the eighteenth century, of writers of fiction framing fictional events within this modern scientific mindset. The broadest form of my hypothesis, by no means original, was that the advancements

in the mathematics of probability achieved by Christian Huygens, the authors of the Port-Royal *Logic*, Abraham de Moivre, John Arbuthnot, Jacob Bernoulli, Thomas Bayes, and others between the mid-seventeenth century and the mid-eighteenth century, combined with the flourishing culture of empirical experiment during this time, would influence if not define the idea of probability as a quality of fiction. But the relationship between mathematical, scientific, and literary probability in this period is of course more complex than any singular pattern of influence could meaningfully describe.

Mathematical probability—frequentism—is put to various uses in both science and literature in this period, but it does not displace other (much less all other) iterations of probability, and neither natural philosophers nor writers of fiction assign the same value to the doctrine of likelihood as do mathematicians. Mathematical probability, as it is formalized over the course of seventeenth and eighteenth centuries, necessarily describes games or other scenarios involving limited variabilities. From prescribing the distribution of outcomes in games of chance (and thus standardizing odds), mathematical probability has developed (particularly in the domain of statistics) to predict likely outcomes for events incorporating high degrees of contingency, for instance the outcome of a football game, election, or natural disaster. The epistemological impact of even simple probability calculations is not to be understated. Judgments and assessments of value that had previously been the domain of experience and memory, for instance the bettor's knowledge that a full house beats a straight, were made objects of incontrovertible knowledge. The problem with frequentism outside of games and contests is that it becomes either difficult or impossible to define satisfactory conditions for the generation and application of a probability. There may be infinite potential outcomes, the thing in question

may only be understandable according to a “trial” period far exceeding the human lifespan, and it may be impossible to know what constitutes an acceptable trial.

Experimental science, as it is instantiated in the seventeenth century, adopts a frequentist notion of probability in the sense that it is invested in extracting a picture of nature from a collection of observations, both inside and outside of artificially controlled settings, but this is far from the whole story. The probable in science, even where it may be defined as likelihood, is not merely that which possesses a “high probability” of occurring. It would be hard to argue, for instance, that when John Wilkins deems it “probable” that the moon is habitable, he means to say that in a high number of trial scenarios, humans thrive on the moon. More properly, he means that within a single (as yet physically unperformable) experiment, the habitability of the moon is a likely outcome. We may “put a number” on such propositions, but it would be math in rhetoric only. A founding member of the Royal Society, Wilkins, like today’s experimental science, admits thought experiments into his considerations of probability; unlike today’s experimental scientists, Wilkins includes fictions among those experiments.

One overarching concern of the following chapters is how, or according to what logic, fictional narratives may serve experimental functions, especially concerning the establishment of probability. It is conceivable, but in actual practice difficult to imagine that fictions could or would perform the work of generating evidence to address questions of natural philosophy or science in a frequentist manner. One generally thinks of fiction instead as “obeying” laws of probability. Unsurprisingly, where the language of frequentism does appear in eighteenth-century fiction, it tends towards the low end of the spectrum of probability. One episode I take up at length in this study is Robinson Crusoe’s cavalier assertion that a certain event had “ten thousand to one” odds of occurring. Later in the century, Laurence Sterne makes light of this

tendency towards the improbable in the early English novel by having Tristram Shandy insist that no “system,” ostensibly any model of causal relationships with predictive capability, could account for the events that define his and his family’s lives. In any amount of simulations, he claims, the events of *Tristram Shandy* would not happen frequently, and perhaps, depending on how one takes Sterne’s irony, would not even happen once. Implicit in both these moments, though for different reasons in each case, is that there is some expectation that fictional narratives should depict events of the sort that generally occur. There are of course fictions before, between, and after Defoe and Sterne that do depict these sorts of events, occasionally even identifying them as such, but it is overly simplistic to consider even the most explicitly probable fictions as existing out of obedience to the recognizable patterns of the world. Probability may be evoked as a mathematically expressible set of laws that works of fiction are supposed to obey, but the law may not always precede the fiction, and the diverging ends of fiction and science over the course of the eighteenth century certainly soften the force of “law” for the former.

The problem with frequentist mathematical probability for both science and fiction is thus twofold: this probability must assume some degree of closure to the range of possibilities, and its insights are bound to a generally predictive structure. Mathematical probability is developed to hierarchically rank the set of things that could result from a given scenario. But assessments of probability need not always imply sequences of trial and outcome. When John Wilkins, Johannes Kepler, Francis Godwin, Cyrano de Bergerac, and Bernard Le Bovier de Fontenelle, among other seventeenth-century thinkers, weigh the probabilities of lunar contact and alien life, they are partly considering whether it is probable that in the future men will go to the moon, but mostly they are posing yes or no questions that are not bound by a plurality of hypothetical trials

or simulations. The questions are, however, framed by empirical knowledge, specifically by assessments of what philosophers of science call “symmetry” between different scenarios. For Kepler, the moon’s topographical resemblance to Earth (an idea he takes from Galileo) renders it probable that it could harbor its own life. Wilkins bases his explicit claim of probability on the same reasons and further argues that prior feats of technological advancement, exploration, and colonization establish the probability that mankind will reach and inhabit the moon as well. Wilkins is not alone among natural philosophers in his belief that works of fiction are capable not only of reflecting but establishing this form of probability. And in the case of Kepler, as we shall see, fiction and scientific conjecture may be mutually supportive within the same authorial corpus.

This use of probability, which long predates the mathematical and scientific revolutions of the seventeenth-century, can be interpreted to mean likelihood, but most fundamentally means credibility. The Latin term *probabilis* is generally defined as “credible,” and is derived from the verb *probare*, which may mean to test, or to prove, or to approve. The word itself thus stands at the axis of science and rhetoric, and this ambiguity is evident in usages like that of Wilkins, which I adopt to describe the probability of seventeenth-century scientific narratives. When Wilkins speaks of a certain scientific principle or potential development as being probable, he means both that it is likely to happen, and that it is in accordance with accepted authorities: in modern terms both probable and approvable. The separation of these two concepts is often cited as an achievement of the scientific revolution, where empirical evidence could be wielded to overturn principles accepted by virtue of being canon, and belief could be placed in ideas independent of their prior approvability. Evidence is rarely probable in itself, however, and one dynamic this study will trace is the Royal Society’s attention to instantiating itself as a credible

authority even while stressing the objectivity of the facts it produces. The most original sense of probability then, belongs to the domain of rhetoric, as probability is, from antiquity through the eighteenth century, evoked more as a quality of a conjecture or piece of testimony than as a descriptor of phenomena in themselves.

The interest of this study is not how probability comes to mean certain things at certain times, but how the epistemological category of the probable, as it develops historically and remains perennially contested, is translated into a quality of literature. One avenue of inquiry that I do not pursue specifically, but which arises throughout this study, is how “probability” falls in and out of line with “verisimilitude.” Aristotle, between the *Rhetoric* and *Poetics*, uses the term *eikos* to refer both to the category of the likely, that which “happens for the most part,” and that of the persuasive, that to which audiences are amenable. Thus, in the *Poetics*, he is able stress that the poet is to prefer the “impossible but plausible” to the “possible but implausible.”³ It is in Cicero’s *Academica* that the phrase *veri simile* is coined to translate Aristotle’s *eikos*. Cicero uses verisimilitude rather than probability to mean, in the Loeb translation, “that which usually occurs in such and such a way.”⁴ Thus, in Johnson’s Dictionary (1755), “Verisimilar” is defined as “Probable,” and both are defined as “likely.”⁵ Throughout the seventeenth and eighteenth centuries, probability and verisimilitude are largely synonymous. By Douglas Patey’s account, whatever differences that existed between them during the Renaissance, that, for instance, verisimilitude is a weaker version of probability, or that the former is based on vulgar opinion and the latter on learned opinion, are smoothed over by Restoration critics.⁶ My usage of these terms is thus necessarily determined by some after-the-fact judgements. While *probabilité* and *vraisemblance* are both used in French neoclassical criticism, the former assumes its modern, scientific meaning in Antoine Arnauld and Pierre Nicole’s *La Logique ou l’art de penser* (1662,

above and hereafter referred to as the Port Royal *Logic*), while the latter has become more critically associated with drama, and has thus emerged as a less fraught definition of Aristotle's *eikos* within the context of poetics. All of this is to say that if I were I to take the period in consideration for guidance, I might have written as much about verisimilitude as probability, and I might, in several instances, have switched the latter for the former. What I have sought to do instead, to keep focus on the aspects of probability that do not, over the course of history, equally belong to verisimilitude, is to work from the present backwards, by treating probability as a concept belonging to mathematics, science, and literature, and to limit verisimilitude to a specifically literary rendering of "that which usually occurs in such and such a way."

The distinction between verisimilitude and probability I believe to be important in relation to the question of realism, which, critics at least since Ian Watt have defined (variously) as the salient feature of the novel. My understanding of novelistic form is informed by Michael McKeon's dialectic of naïve empiricism and extreme skepticism, though I cite several critics, such as Watt and Thomas Pavel who use "realism" or "naïve realism" to refer to what McKeon characterizes as naïve empiricism, an approach to fiction as though it were fact. Naïve empiricism, as practiced, for instance, by Daniel Defoe, aspires to probability of testimony while often eschewing probability as likelihood. That is, Defoe's speakers aim to be believed in spite of, or indeed *because* what they claim in their accounts is not commonly observed. Under this broad understanding of probability, Defoe, Samuel Richardson, and Henry Fielding all write "probable" fictions. Part of the aim of this study is to contextualize the difference between Defoe's probable testimony of improbable events and Richardson's pseudo-mathematical modeling of probable events. Probability is an ingredient of realism insofar as realism entails a

self-conscious engagement with fiction, so that characters and events may be understood as both accurate to external reality and as abstractions of that reality. In this sense, the mathematical dimension of probability is more suited to the achievement of this abstraction of the world than the similarity entailed by verisimilitude.

This project then, is an attempt to frame the dialectic between probability as a rhetorical quality, long interchangeable with verisimilitude, and probability as a scientific measure of likelihood, and to frame this dialectic within the larger dialectic of science and fiction. Several of the works I address in this study illustrate Boileau's famed formulation that "Le vrai peut quelquefois n'être pas vraisemblable," which is itself derived from Aristotle's idea of the possible but implausible. I argue that in fictions that address questions of science, the new probability of the seventeenth century is not as much absorbed or coopted into traditional probability as held against it. Per Boileau's axiom, probability as an empirical measure of frequency is figured, by writers of fiction, as more suited to establish the relatability of fiction than to actually advance scientific ideas. A fruitful illustration of this rejection of mathematical probability is Defoe's *A Journal of the Plague Year* (1722), the first novel to incorporate historical statistics. If mathematical probability were ever to be squared with verisimilitude, this text should be the paradigmatic example. Instead, Defoe insists on the credibility of his narrator's observations in support of scientific conclusions about the plague, but in a manner that is mostly against the grain of the statistics he wields. Where something like frequentist probability appears in later English novels, it is bound to a position of manifest fictionality, as novelists wield probability as a feature of a specifically aesthetic experience.

In order to make my account more intelligible, I adopt at times a distinction between "internal" and "external" probability, which are terms Patey uses to consolidate a general pattern

of distinctions made by critics and rhetoricians from the middle ages through the present. The most relevant iteration of these two canons of probability for the English novel (which I discuss at some length in the final chapter) appears in John Locke's *Essay Concerning Human Understanding* (1690). Locke puts forth two overarching categories for assessing the probability of testimony: the quality of the evidence (and its source or sources), and the "consistency of the parts... of the relation."⁷ Though Locke is referring to instances in which a question regarding the actual world is to be adjudicated, this latter form also contains the potential to describe a genre of probable fiction that circumvents the codes of naïve empiricism, i.e. the novel. Internal probability is thus a criterion of scientific credibility and of aesthetic quality. The rise of experimental science, and along with it an understanding of probability as an objective rather than subjective category (mathematical likelihood rather than consistency) is attended by a persistent emphasis on the external. In Robert Boyle's early Royal Society, knowledge is to be discovered rather than created. Naïve empiricist fictions like Defoe's appear to ape the procedures of experimental science by insisting on the accuracy of reported facts as the guarantor of credibility. I argue, however, that both in fiction and in the culture of experiment, internal probability is often tasked with evidential responsibility where facts alone cannot pull their weight. In the mature English novel, I argue, the methodologies of external probability are reproduced within fiction, so that fictional worlds achieve a metaphysical autonomy that the ambiguity within probability had long denied.

In covering a large historical period and a range of genres, this project does not seek to replicate the encyclopedic work of Patey or Ian Hacking on the topic of probability. What I hope to provide is a (necessarily fragmented) narrative of the bifurcation of literature and science over the course of the enlightenment on the question of probability. In taking this broader view, I hope

to supplement the work done by scholars like Thomas Kavanagh and Jesse Molesworth, who have brought to light the centrality of aleatory phenomena in eighteenth-century science and fiction, respectively. As the title of this study suggests, I understand probability to be both a concept belonging to rhetoric, and a concept capable of being wielded to rhetorical effect. Defoe, for example, invokes mathematical probability—both the language of games of chance and of statistical analysis—but does not apply it as such. In this sense, I employ the term “rhetoric” with the sense of automatic conflict described by Stanley Fish, as both a historical discipline and a qualifier associated with seeming or pretending.⁸ Without suggesting that the chronological procession of chapters is at all indicative of the complete discourse around probability in this historical period, I hope to illustrate probability’s passage from soliciting real belief to signifying fictionality.

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The first chapter focuses on a set of works composed (for the most part) before the mathematical turn in probability and before the widespread legitimization of experimental science. The question of this chapter is how scientific hypotheses can pursue probability through the integration of empirical observation and fictional narrative. This form of probability is particularly crucial for proponents of Copernican astronomy because, though the upending of the geocentric model is based on empirical observation, the conclusions of the new astronomy are not strongly evident from those observations. I examine at length two fictional narratives published in the 1630s, Johannes Kepler’s *Somnium* (1634, though composed significantly earlier) and Francis Godwin’s *The Man in the Moone* (1638) which support (the former explicitly and the latter implicitly) heliocentrism and the physical equivalence between earth and the moon. Both of these texts are manifest fictions, but use versions of internal probability to support

hypotheses about the actual physical world. In this sense, I argue, these works bridge probability in the ancient sense, typified in astronomy by deference to scholastic authority, and the probability formulated by Restoration experimental science, which is established by the replication of experimental results and the multiplication of witnesses. These astronomical fictions offer virtual witnessing, but, as I argue, this does not mean presenting fictional facts as though they were actual, but creating an absorbing experience that implicates the mind of the reader as the ultimate site of evidence. This form of evidence is contractual (the title of the chapter refers to an explicit contract that Kepler offers his reader), and anticipates a theory of knowledge equally dependent on the capacities of the subject as on the facts of sensation, articulated in various forms by Descartes, Hobbes, and the Common Sense Philosophy of the later eighteenth century, where the discernment of probability is theorized as an innate capacity. I close this chapter with a discussion of a slightly later imaginary travel narrative, Margaret Cavendish's *The Blazing World* (1666), which undermines this contractual model of natural philosophy by equating it with the experience of reading fiction.

Turning from the macrocosmic to the microcosmic, chapter two concerns the relationship between narrative and experimental science in producing probable conjectures about phenomena that elude direct empirical observation. The primary text of this chapter is Daniel Defoe's proto-novel *A Journal of the Plague Year* (1722), which, because it is advertised as a first-hand account of the 1665 London plague, I discuss within the context of the experimental culture of the early Royal Society in the late seventeenth century, and in particular Boyle's writings about medicine, or physic. Both the novel and the experimental reports from which it takes direction are premised on an idea of frequentist probability. The validity of experimental science, especially concerning matters like disease, where the presumed material cause of phenomena

cannot be observed as such, is inevitably dependent on probable judgements made on the basis of repeated observation. *A Journal* is notable because, in addition to descriptions of specific cases, Defoe includes statistics in the form of the city's actual bills of mortality from the year 1665. But, rather than relying on these numbers to corroborate the probability of the scientific conjectures he advances, namely that quarantine is the most effective method of counteraction (and implicitly that the plague is a material pathogen), Defoe relies more on the probability of his narrator's testimony. One reason for this is that Defoe's understanding of providence (variously formulated across his corpus) does not allow for divine will to be known strictly through the regularity of patterns, but this does not mean that either Defoe or the Christian experimentalist tradition he voices does not believe in the validity of scientific intervention. Rather, I argue, it is only an abstracted "assent to probability" that can persuade where the data cannot speak for itself.

The third chapter is, to some degree, also about the weakness of empiricism as it is practiced and advertised at the turn of the eighteenth century. Keeping focus on Defoe, I connect his apparent indifference to mathematical probability in *A Journal of the Plague Year* to *Robinson Crusoe* (1719) and his earlier *Essay Upon Projects* (1697). In both *Crusoe* and the *Essay*, Defoe suggests that the evidence of experience is always insufficient to determine the real probability of events. This logic supports both his approach to verisimilitude, where the seeming improbability of events is reason to accept them as true to life, and his defense of novelty in science and politics. In the *Essay*, Defoe defends the suspicious—because improbable—category of "projects" on the grounds that prior experience is a weak indicator of future developments. I see Defoe's defense as latently operative in what is ostensibly history's most scathing critique of projects: Part III of Jonathan Swift's *Gulliver's Travels* (1726), in which is depicted a series of

projectors at work on manifestly improbable propositions. Swift's projectors, however, are not universally operating against reason (as many have claimed them to be). At worst, they are on a spectrum with what Swift might have recognized as legitimate scientific practice. Furthermore, over the course of the novel, the logic of common sense held against the projectors is revealed to be contingent or otherwise mistake prone. Defoe's positivist and Swift's conservative positions overlap on the question of probable conjecture, which both authors recognize to be a species of fiction making. In either case, any hierarchical distinction between external and internal probability is revealed to be a mutable product of a particular historical or narrative framework.

Through the first three chapters, probability, both internal and external, marks a point of connection between the ends of science and the ends of fiction, which is to say that many of the fictions discussed are invested in advancing scientific claims. The final chapter moves away from explicitly scientific narratives in order to illustrate a reversal in the relationship between probability and science in fiction. As the English novel incorporates the forms of probability employed by modern science, the function of probability within fiction is internalized, directed towards an aesthetic experience rather than external claims about the world. What I propose is essentially a rethinking of Fielding's claim that the novel is bound to deal in the probable rather than the merely possible, by which he means that the genre should depict the sorts of things that typically occur rather than the extraordinary but possible things depicted by Defoe. This restriction enables an understanding of fiction as illustrative artifice rather than degraded imitation of experimental science. What Fielding considers under the banner of probability has been taken up, more-or-less, by modern analytic philosophy as "possibility," specifically within the Leibnizian designation of "close" possible worlds.

I take a detour from strictly historical analysis to accommodate some narratological applications of possible worlds to the eighteenth-century novel, and to consider how the probable might be properly distinguished from the possible. In particular, I see in Richardson's *Clarissa* (1748) both an obvious attention to probability-as-verisimilitude (Fielding's probable) and a more self-conscious and particularly mathematical application of probability at the level of plot. In other words, *Clarissa* is not just probable, its plot illustrates principles of probability that are not necessary to its being taken as an accurate portrayal of life. I see a more extreme illustration of the rending of probability and possibility in Laurence Sterne's *Tristram Shandy* (1759-1767), which in its central plot, the life of Tristram, adopts a naïve empiricist approach to its own credibility by insisting on the truth of events because of their improbability in frequentist terms. In the novel's most prominent subplot, however, Tristram's uncle Toby recreates historical battles that occur according to strict probabilistic calculations. In the success of Toby's project and the inevitable failure of Tristram's, Sterne, I argue, offers mathematical probability as model for narrative intelligibility and satisfaction rather than as a metric of external accuracy. For both Richardson and Sterne, the concern of fiction is no longer to simply provide a credible replication of the world. And in the advancement beyond this concern, probability is able to be incorporated into the aesthetic rather than evidential ends of storytelling.

Notes

¹ William Feller, *An Introduction to Probability Theory and its Applications* (New York: Wiley, 1957) 19

² Brandon Fitelson, "Probability," *The Philosophy of Science: An Encyclopedia* eds. Sahotra Sarkar and Jessica Pfeiffer (New York: Routledge, 2006) 601

³ Aristotle, *The Poetics of Aristotle*, ed. and trans. Stephen Halliwell (Chapel Hill: University of North Carolina Press, 1987) 60. The most widely quoted translation of this rule uses the terms "probable impossibilities" and "possible improbabilities," though it is rare in modern editions. I discuss historical distinctions between probability in plausibility (which influence modern translations of Aristotle) in chapter one and four.

⁴ Cicero, *Academica* Vol. II trans. H. Rackham (London: Loeb Classical Library, 1967), 32

⁵ See "verisimilar" and "probable" in Samuel Johnson, *Dictionary of the English Language* (1755)

⁶ Douglas Patey, *Probability and Literary Form: Philosophic Theory and Literary Practice in the Augustan Age* (New York: Cambridge University Press, 1984) 16-17

⁷ John Locke, *An Essay Concerning Human Understanding* ed. Peter Nidditch (New York: Oxford University Press, 1975) 656

⁸ See Stanley Fish, "Rhetoric," *Critical Terms for Literary Study* eds. Frank Lentricchia and Thomas McLaughlin (Chicago: University of Chicago Press, 1995) 203-222

Chapter One

“I shall prove to you that I see them”: Possible Knowledge, Credible Fiction, and the Uses of Empiricism

That the modes of scientific and fictional writing are not categorically distinct in Europe before or throughout the eighteenth century is an uncontroversial claim. Critics have long believed that the practices of experimental science established over the latter half of the seventeenth century by the Royal Society informed the work of early novelists like Aphra Behn and Daniel Defoe, and more recently the inverse process—the contribution of fiction writing to scientific practice—has been recognized. In various ways, critics have characterized the split between the two disciplines as a reciprocal process originating out of a period of close exchange, or permeability. As John Bender claims, “the eighteenth-century novel was part of a cultural system that worked to validate Enlightenment canons of knowledge by dynamically linking the realms of science and fiction in the very process of setting them in opposition.”¹ The resolution to this process is the allotment of the domain of the “fictional” to literature, and the domain of the “hypothetical” to science, where previously those ideas had been confused if not undifferentiated in discourse. More recently, Michael McKeon has characterized the emergence of “the aesthetic” as a discourse in the eighteenth century as a process of delineation from the scientific, though largely to stress the debt of the former to the latter, so that the two are only set apart at the moment their formal linkage is theorized.² In this narrative of the development of the idea of literary fiction between the seventeenth and eighteenth centuries, fiction emulates the structure of the scientific experiment and ultimately renders the experiment as part of an aesthetic experience. Scientific practice, on the other hand, strives precisely to glean results

(which entail probabilistic assent rather than imaginative pleasure) that transcend the structure of the experiment.

In our current understanding, experimental scientists produce knowledge about the natural world in the artificial setting of a laboratory that, ideally, is understood to be independent of the conditions of its production, while writers of literary fiction convey ideas about the real world that can exist only in reference to the fictional conditions of their revelation (if an Englishman were to live alone on an island, if a virtuous servant woman were to be pursued by her master, etc.). The latter chapters of this dissertation will address some of the complications to this essential delineation that emerge after the rise of the institutional authority of empirical science and after the so-called rise of the English novel in its wake (that is to say, after literature and science have undergone the disciplinary split that we maintain today). The concern of this chapter is the articulation of this separation between the seventeenth and eighteenth centuries. By the time of the establishment of the Royal Society in 1660, the translation of experimental results into general truths was anything but an accepted convention. Experimentalists needed not only to prove the reliability and reproducibility of their results, but justify these results as evidence for theories running counter to canonical understandings of natural law.³ The inchoate culture of experiment both relies on the credit of witness testimony, and, through the promotion of virtual witnessing via written account, dematerializes the concept of evidence while arguing for material certainties. In exploring the place of fiction in the mediation of this tension, I will look at a body of seventeenth-century narratives that address contemporary scientific hypotheses in order to trace the complex dynamics of truth claims relative to the conditions of their appearance in pre-Royal Society, pre-novelistic fiction. I argue that fictional texts such as Johannes Kepler's *Somnium* (written in Latin 1609, distributed in manuscript 1610, published 1634)⁴ and Francis

Godwin's *The Man in the Moone* (date of composition unknown, published 1638)⁵ espouse claims about the actual world that seem to be independent of the truthfulness or even possibility of their surrounding narratives, but that these texts use techniques similar to those of later verisimilar fictions to communicate impossible-to-verify truths through plausible narration.⁶

In the latter half of this chapter, I examine the tension, both real and perceived, between description and narration in the period, through the analysis of another other-worldly travel narrative, Margaret Cavendish, Duchess of Newcastle's *The Description of a New World, Called The Blazing-World* (1666). Cavendish's text, which has been called an apogee of the genre, shares with Kepler and Godwin both its essential premise (a journey to another inhabited world), and an uneasy relationship to the form of the "description" (the body of texts that advertise themselves as such in their titles or subtitles), which I understand to include both accounts of locations (e.g. new worlds) and scientific experiments. The epistemological subtext of Kepler's and Godwin's narratives, that knowledge proceeds from sense even if that sense is imaginative, is dramatized literally by Cavendish, specifically in a passage in which various natural philosophical models are physicalized as moments of intense action. All of these texts, I argue, reference the inchoate scientific (and ancient poetic) convention of displaying knowledge through detailed description, while understanding the acquisition of knowledge as active and embodied. I see the evidential function of these texts not only in the richness or internal consistency of their descriptions (which for Kepler and Godwin are descriptions of the natural world from an imaginary perspective, and for Cavendish are descriptions of a purely imaginary world), but in their packaging of scientific insight as narrative intrigue.

I focus my attention, first, on the *Somnium* and *The Man in the Moone*, two texts that treat a cluster of hypotheses central to the new astronomy—the earth's movement, the possibility

of travel through space, and the ontological continuity between the earth and moon (in other words, the ontological non-distinction between the Ptolemaic sublunar and lunar realms)—because they present unique insights into the epistemological crisis around possible knowledge. Both of these narratives were written by early adopters of beliefs that, aside from being heretical, lacked evidence in the form of unaided sense data. Such evidence was impossible because, as Alexandre Koyré reminds us, the difference in the mathematics for geo- and heliocentric models of celestial motion worked out, more or less, to a simple substitution of one constant for another.⁷ The calculations being equivalent, the geocentric model had the advantage of being verifiable by simple empirical observation: it is plain to see that the sun rises and sets. The question of whether the universe consists of fixed rotating spheres or open space was more difficult to answer in this manner, but the language of fixed spheres had been the accepted one for centuries and the claims to the moon and other planets' material equivalence with earth depended upon the allegedly dubious optical technology of the telescope.⁸ Lunar voyage narratives thus occupy a space in the interstice of scientific practice and fiction, as they are both utterly implausible and necessarily plausible at once; they suppose a condition of knowledge that is outside the scope of empiricism but is both geometrically demonstrable and physically imaginable.

The Scientific Hypothesis and the Articulation of Probable Fiction

The movement of the earth and the relative movement of the planets could be explained but not properly experienced. Current science operates mostly within such parameters, but the inverse relationship was far preferred in seventeenth-century matters of belief. As a counterpoint

to astronomical demonstration, for instance, we might consider the rich seventeenth-century tradition of apparition narratives and demonological accounts, whose veracity was strongly associated with the collection of sense data, even while depending upon revealed theology rather than scientific hypothesis as an explanatory framework. In *Sadducismus Triumphatus* (1689), Joseph Glanvill's collection of eye-witness reports from encounters with apparitions (compiled at the behest of Robert Boyle), Glanvill refers to the existence of spirits as "a matter of fact," insisting that "Matters of Fact cannot be denied because we cannot conceive how they can be performed."⁹ Such weight attached to sensory evidence over and above hypothetical models echoes Thomas Sprat's remarks upon the empirical method in his *History of the Royal Society* (1676), wherein he affirms the "contention of hands and eyes" even and especially against the "dominion of reason." Glanvill's writing on apparitions would come to define the genre, and would ultimately provide stylistic directions for early novels now referred to as empiricist.¹⁰

If apparition is the scientific question most neatly and paradigmatically translated to "matter of fact" by a strictly observational program, such a course is impossible for astronomical or otherwise cosmological conjectures. The late-sixteenth- and early seventeenth-century astronomers associated with the new astronomy, Copernicus, Galileo, Brahe, and Kepler, produced mathematical demonstrations to translate their telescope-aided observations into planetary models. Kepler's model even accommodates many of the central tenets of received doctrine, maintaining a modified version of the Ptolemaic spheres in which the relative distance of the planets from the sun corresponded to a progression of three dimensional polygons, premised upon a conception of divine mathematics. But the ancient-leaning elements of Kepler's thought illuminate his ongoing mathematical analysis and not the other way around.¹¹ The claims for the various iterations of cosmic systems put forth by the new astronomy interpreted precise

observational data with geometrical rigor, but, while these accounts marked an epistemological evolution from the conjectural skepticism of figures like Epicurus, Nicholas Cusanus, and Giordano Bruno, they did not allow for the kind of publicly replicable sensory confirmation that allowed apparitions to become “matters of fact.” This unequal standard can be understood as matter of quantitative discrepancy (more people could and did offer proof of the existence of immaterial spirits than “observed” a heliocentric planetary motion) but also of categorical difference, as the visibility of most if not all of the new astronomy’s claims was doubly in question. That is to say, by seventeenth-century standards, several people seeing spirits could demonstrate the existence of spirits, and this point was thus more demonstrable than the non-existence of spirits. Revisions to the dominant cosmological model could not depend on such a proliferation of experiential (or experimental) verification.

But neither could astronomy attain popular legitimacy through its association with geometry, specifically its employment of geometrical diagram to communicate relationships between celestial bodies. Arguments presented through the internal consistency of mathematical representations constrained the knowledge they displayed to the domain of the hypothetical (thus allowing them to be taught as mathematical exercises rather than manifest heresy). In Foucault’s influential account of early modern epistemology, the seventeenth century is the period in which the artificial sign is recognized as an object of knowledge independent of its relationship to the natural world, and Cartesian geometry is central to this transformation.¹² As Descartes’s thought experiment on the ideal triangle attests, the laws of nature need not present themselves before the eyes of man, or even be manifest anywhere, to be known to man.¹³ But this is a different sort of knowledge than the knowledge that the sun moves around the earth daily; it is, as Rüdiger Campe calls it “a divide between certainty about being and certainty about the necessary nature

of objects of knowledge whose actual existence remains hypothetical.” As Campe notes, in the essays appended to the *Discours de la méthode* (1637), including his comments on cosmology, Descartes attempts to merge hypothetical and empirical knowledge through dense prose explication that itself references symbolic illustrations. The function of evidence thus seems to be achieved only when geometry is able to present itself before the eye as something actual, or, as Campe concludes, “Descartes’ evidence is the moment of an eidetic experience on a non-eidetic basis.”¹⁴ We might equally recognize this as the ambition of Kepler in transfiguring the wisdom of his diagrams into the rich imaginative world of his fiction, as a means of fusing abstraction with visual intuition to forge evidence.

This process of rendering geometrically demonstrable but not strictly observable natural phenomena evident operates according to an inverse dynamic as that for rendering the existence of spirits evident: first the explanatory framework needs to be granted as provisionally truthful by the reader, then sensory evidence may offer confirmation. Such rhetoric, explicit in all the cosmological fictions discussed in this chapter, runs parallel to the arguments made by mid-eighteenth-century novelists and critics that, in fictional narrative, belief in the possibility of characters and events are necessary as a prior condition to reading them as truthful.¹⁵ These lunar voyages, however, do not ask for or require a suspension of disbelief, as, unlike eighteenth-century novels, their topic is not, or is only obliquely related to relationships between humans (a difference whose implications I explore in later chapters). When Horace Walpole asks the reader in the preface to *The Castle of Otranto* (1764) to “allow the possibility of the facts,” he suggests that if the reader does not discount the value of the story on account of its fantastic elements, the portrayal of the characters will seem accurate to human nature, but not that enormous helmets could actually fall out of the sky. There is no such distinction between human nature and nature

proper in these seventeenth-century lunar voyages (though they are not entirely devoid of human drama). Rather, flourishes of empirical writing are inserted to affirm precisely the phenomena they describe, for instance, the diurnal rotation of the earth or the feeling of weightlessness in space. Such attention to detail is, however, anomalous within the totality of these narratives, which are manifestly fictional as well as formally and politically parodic. If apparition narratives rely on a totalizing empiricist paradigm, lunar voyages deploy empiricism as a technique for conferring matters of fact, but in doing so place witnessing and sensation (what Sprat calls “the contention of hands and eyes”) within a system of belief that admits imaginatively generated knowledge on the grounds that it ceases to be imaginary once known. At the conclusion of this chapter and in those following I refer to this kind of knowledge as a species of “self-evidence.”

I take interest in the *Somnium* and *The Man in the Moone* specifically because, despite their generic divergence, both represent space travel in the form of narrative fiction, a term I use to delineate these texts both from forms of narrative that point to some external discourse (e.g. allegory) and from non-narrative forms (e.g. natural philosophical discourse, dialogue) or poetry. Without reducing these works to the category of the “proto-novelistic,” I do want to stress their continuity with the fiction of the following century and the developing criteria of the realistic (the “probable” as applied to the novel). One of the few recent critics to give these texts serious consideration in relation to each other, within both the history of science and fiction, Frédérique Aït-Touati, discusses these works alongside “optical” voyages like Robert Hooke’s *Micrographia* (1665) and conjectural voyages like Bernard Le Bovier de Fontenelle’s *Conversations on the Plurality of Worlds* (1686). The interest of this chapter, however, is in the relationship of the narrative aspect of the voyage, in particular the representation of physical sensation, to the evidential function. The flight through space described by Kepler more

resembles the flight of Satan through the abyss described by Milton in *Paradise Lost* in terms of its astonishingly physical register than the idle mention of men flying by wings described by Fontenelle. But just as importantly, Kepler's demonological and dream-framed flight is nonetheless the flight of a human body through real space, and not, as in its closest predecessor, Cicero's "Dream of Scipio," the flight of a soul.¹⁶ The lunar voyages of the seventeenth century are not the first cosmic travel narratives but rather the first modern ones, a distinction that is typological and not simply temporal. Along with the "Dream of Scipio," Plato's Myth of Er and *Phaedrus*, Lucian's *True History*, Plutarch's *On the Face in the Moon* all describe some form of travel between earth and celestial bodies, and their seventeenth-century inheritors share with them a parabolic approach to the implications of extraterrestrial travel. What distinguishes the modern voyage is that it is not only parable, which is to say that its truthful element is both something physically manifest in the world and intimately related to the narrative's potential actuality.

Beginning with Kepler, the actual voyage to the moon, by means of some conveyance, becomes a matter worthy of consideration according to both principles of astronomy and mechanics. Though Kepler, for his part, insists in his annotations to the *Somnium* that Plutarch's honest astronomical opinions are apparent in his fanciful tale, and though his own tale only contains an inset account of travel between the earth and moon by means of demon, Kepler advances the genre by exploring the mechanics of the travel as a serious question. The narrator of the later part of the tale, the Daemon of Levania (the moon), describes the experience of flight in vivid terms, stressing its effects on human physiology and providing detailed visual commentary on the earth as encountered from space. Through these short passages of sensuous detail, the moon voyage demands to be read not as a displacement of truth in fiction—as a

parable, allegory or metaphor, but as a circular proof of the phenomenon it describes. The capacity to imagine space travel that Kepler's narration enables is in itself proof of space travel's consistency with empirically knowable phenomena of the sort one can bring to mind or recall without imaginative invention. Kepler's reader, as I will argue, is not so much convinced of Kepler's knowledge by his description's successful replication of an empirical account, but by the capacity of the narration to obviate the sense of replication.

The *Somnium* uses a complex system of narrative subordination to couch its presentation of Kepler's own astronomical findings in the rhetoric of fable; it details a secondhand account by a supernatural figure recorded in a document read in a dream. Godwin's tale, on the other hand, is picaresque subversion of chivalric romance and travel/shipwreck narratives that becomes a utopian encounter, and is narrated as if it were historical, in the style of so many "true relations" or "true accounts" of oriental and American lands. Both texts, however, use the apparatus of their fiction to make tenets of the new astronomy accessible to the readerly imagination. Texts such as these are best understood as "completing" the Copernican revolution, not as evidence, but in lieu of evidence, as thought-experiments that produce the conditions for impossible observations.¹⁷ For this reason lunar voyages are a useful counter-model to the empiricist novels of the early eighteenth century. Daniel Defoe's *A Journal of the Plague Year*, which I discuss at length in the following chapter, combines first person empirical observation with statistical analysis in order to make claims about plague pathology. We can understand Defoe's reliance on virtual witnessing as an aestheticized but intuitive extension of actual witnessing. To virtually witness the earth's rotation from space, as Kepler and Godwin allow their readers to do, requires a higher degree of synthetic imaginative operation than what Defoe asks of his readers, because the scientific claims at stake cannot be illuminated by a Glanvillian proliferation of data and human

observation (what Hacking calls “long observation”) but require a kind of suspension of the human perspective.¹⁸ The critical attention that works like the *Somnium* and *The Man in the Moone* have received has largely been dedicated to historicizing the rise of science fiction as a proper genre in the nineteenth century, so that they are notable for their remarkably early anticipation of figures like Jules Verne.¹⁹ But to understand these works in the retrospective register as “early science fiction” is to solidify some methodological tensions that need to be understood as dynamic.

Rather than seeing these works as part of the same discourse of “science fiction,” we could recognize them each as a kind of mutation of genres we now recognize as precursors to the modern novel generally: the *Dream* is an almost-allegory, *The Man in the Moone* is a combination of picaresque, (satirical) travel narrative, and utopia. The formal logic of the *Somnium* is, for instance, strikingly similar to the consummate novelistic allegory, John Bunyan’s *The Pilgrim’s Progress* (1678). Like that text (also a dream narrative), Kepler’s *Somnium* presents itself as a set of references in need of glossing, a pleasing surface for a set of reflected meanings. Kepler’s corpus of astronomical writing, through a system of footnotes, functions like Bunyan’s bible, as the assumed locus of ultimate meaning. But in similar fashion, both texts strain the interpretive capacity of a strictly referential reading under the weight of empirically rendered passages that are simply too lively to refer beyond themselves as sites of meaning. At the same time, however, it would be no less extreme to suggest that Kepler’s fiction is something other than a conduit for his astronomy than to suggest that *The Pilgrim’s Progress* is something other than a conduit for Christian doctrine.

The Man in the Moone, by contrast, gives significant attention to a set of scientific hypotheses while by no means existing for the sake of those hypotheses. Like the fanciful vehicle

in which its hero glides to the surface of the moon, the narrative seems loosely woven together, mingling the intrigue of space travel with a host of pre-existing literary traditions. A typical seventeenth-century virtuoso, Godwin is interested in cosmology, but more fixated on what Margaret Cohen has called “practical reason,” a form of embodied intelligence defined by acuity of senses, intuitions, and physical actions.²⁰ Godwin’s Domingo Gonsales, as we shall see, is a consummate observer, experimenter and tinkerer, as well as an opportunist. His voyage to the moon is merely the most extended episode in a picaresque narrative that has him transported from situation to situation within a sequence of thinly elaborated comical causes. The majority of the work consists of his encounter with the Lunar people, Christians in possession of a host of resources and technologies that allow for things more incredible than space travel.²¹ The Utopian encounter seems at once to echo the optimism of Bacon’s *New Atlantis* (1624) and prefigure the absurd culture of “projectors” in the third part Swift’s of *Gulliver’s Travels*.²² The moon voyage, in this context, is in line with the ancient tradition of imaginary travel while reflecting an inchoate sense of the moon’s possibility, or inevitability as a destination for human exploration.

For both the *Dream* and *The Man in the Moone*, I argue that the experience of space travel, by virtue of its descriptive thickness relative to the surrounding narrative, demands to be read not simply as an imaginative exercise or narrative convenience, but as a literal event. The brief but conspicuous passages in these works that physicalize space travel as a set of familiar sensations are crucial to their communication of scientific claims within a fictional scenario. I present these texts together to emphasize this point as one that transcends the most glaring difference between these two texts as conduits of science: that Kepler’s fiction is explicitly underwritten by Kepler the astronomer while Godwin’s is without such a program. In the following pages, I attempt to illustrate how Kepler’s fiction illuminates Kepler’s astronomy

explicitly through the interplay of text and astronomical footnotes, but also intuitively through its appeals to a physical knowledge that needs no concept. Godwin's text, which contains only a single reference to Copernicus but indicates a debt to Kepler²³, may consequently be read as a work interested in such intuitive knowledge as an autonomous category (though not necessarily at the expense of the sort of observational-mathematical knowledge that Kepler demonstrated). The reading of these two texts side-by-side helps isolate fiction as a proper conduit for fact, and reveals the potential for probability from authority and narrative probability to bolster one another.

Here some final clarification of the stakes of my analysis is in order. Because my argument focuses on the portrayal of astrophysics in narrative, I do not devote significant attention to Godwin's account of lunar society, which, fascinating as it is, belongs to the genre of utopian description, and thus does not contain the kind of mediation of concepts in narrative form that this chapter aims to explore. Unsurprisingly, however, it was the portrayal by both Kepler and Godwin of other inhabited worlds that most captivated, or more often, unsettled contemporary readers. Indeed, Godwin's marvelous yet Christian lunars seem designed precisely to quell the implications of extraterrestrial life with levity (or at least to remind English readers that such societies are scarcely more remote from them than China). While both authors depart from Galileo in supposing the moon to be inhabited (and having life-sustaining bodies of water), Kepler appears to do so out of earnest scientific conviction rather than narrative opportunity. The inhabitants of Kepler's moon, which are elaborated according to his probabilistic considerations of what sorts of life forms could inhabit the moon's landscape as he understood it, are large, monstrous and decidedly inhuman. This vision of alterity in the universe grapples more directly with the implications of a plurality of worlds than does Godwin's (or for that matter, Godwin's

successors, Cavendish, Fontenelle, and Cyrano de Bergerac), precisely because they are derived from the uncertainty implicit in a vision of the universe in which the human world is both not at the center of the created universe and ignorant of the rest of it.

The *Somnium* thus further stands out, as not only the first and most earnest of the modern space voyages, but as a literary embrace of the physical realities of new astronomy amidst an atmosphere defined by profound aversions to its theoretical implications. Among the most famous and thorough literary expression of this aversion is the poetry of John Donne, which frequently touches upon the possibility of other worlds, but often, as in the case of “The First Anniversary,” as a proposition that necessarily challenges Christian doctrine. As William Empson offers succinctly, in reference to this challenge, “No reasonable man would want space travel as such,” before reading the metaphysical poet’s acceptance of the possibility of other worlds as proof of his enduring faith. Donne’s approach to the otherworldly appears as an embrace of the skepticism of Giordano Bruno and Nicholas Cusanus, transformed through a kind of Pascalian wager into an article of faith. That Donne should happen to be one of Kepler’s most important interlocutors reveals as much about the program of Kepler’s fiction as about Donne’s anxieties over new astronomy.

Before finally moving into a discussion of Kepler’s text, I will briefly examine his and Donne’s micro-rivalry in order to illustrate the divided valence of the new astronomy within literature as related to, but distinct from, questions of religion. The conflict originates in Donne’s *Ignatius, His Conclave* (1611), a satirical prose work that takes place in hell, in which Donne refers to Galileo as “[he] who of late hath summoned the other worlds, the Stars, to come neerer to him, and give him account of themselves,” and “Keppler, who (as himselfe testifies of himselfe) ever since Tycho Brahe’s death, hath received it into his care, that no new thing should

be done in heaven without his knowledge.”²⁴ This satirical Donne is of course more playful than the poet who lamented the decay of the known universe in “The First Anniversary,” here embracing the idea of a world in the moon as an opportunity to excommunicate Jesuits, in a manner that prefigures the moon’s provenance in later-seventeenth-century satire. Donne’s target, like that of many later satirists, is astronomers’ claims to knowledge of objects like the stars and heavens that are by nature outside the bounds of revealed knowledge.

It was not, however, to the insult to astronomy that Kepler responds in one of the footnotes added to the *Somnium* between 1620 and 1621. The eighth footnote begins:

If I am not mistaken the author of that insolent satire called Ignatius, His Conclave, got hold of a copy of this little work of mine, he stings me by name at the very beginning. As he goes along he brings poor Copernicus before the tribunal of Pluto, to which, if I am not mistaken, there is access through the abysses of Hekla. You, my friends, who have some knowledge of my affairs, and know the cause of my last trip to Swabia, especially those of you who have previously seen this manuscript, will judge that this writing and those affairs were ominous for me and mine.²⁵

In short, Kepler implicates Donne as having heard someone read or describe a manuscript of the *Somnium* in a barber shop (*tonstrinae*) in 1610, after some friends of Kepler’s had taken copies abroad, and having disseminated a portrayal of Kepler as an occult figure on this account. More specifically, Kepler is suggesting that Donne’s recycling of the folkloric references that appear in the *Somnium* ignited suspicions that led to his mother’s condemnation for witchcraft in 1615 and imprisonment in 1620. Beyond Kepler’s insistence, there is no good reason to believe that Donne knew about the *Somnium*; and it is more likely that *Ignatius, His Conclave* was composed before the *Somnium* leaked out of Kepler’s hands and that the image of the Icelandic volcano Hekla as a portal came to Donne through the same folkloric sources by which it came to Kepler. In his seeming paranoia, Kepler has assumed that the wrong parts of his fictional text have been associated with facts—that the hero has been read as a version of himself, and his occult indoctrinated mother has been read as Katharina Kepler. In truth, Donne’s satire does not imply

as much, and it is Kepler-as-astronomer who is scrutinized, not for obtaining or claiming to obtain knowledge through dark arts, but for claiming to have special knowledge of extraterrestrial things at all. Kepler displays justifiable wariness of defamation given both the trials of his mother and the widespread hostility towards new astronomy, but it is nonetheless curious that he should recognize himself defamed as a sorcerer rather than scientist, and that he should be so sure that it is the misreading of his fiction rather than the proper reading of his scientific conjectures (however skeptical or hostile) that he must fear.

It warrants repeating that Kepler's ire is directed towards a leak and not towards the reception of the publication. Far from being surprised by the suspicions he recognized mounting against his family, he was aggravated by the prospect of dealing with this inevitability in his lifetime. Anticipating such backlash against himself and his mother, he made plans for the *Somnium* to be published posthumously. Thus the publication of the *Somnium*, and the attention that Kepler devoted to it as his final work, seems to point to a paradox: that he believed a fiction, couched in the language of folklore, would do more to advance his ideas than his letters or treatises, while also believing that this fictional framework would make him more liable to persecution than the science it revealed.²⁶ Like its coded but unambiguous eighth footnote, the *Somnium* is a shibboleth, not for those friends and followers of Kepler who already know its meaning, but for those readers capable of being convinced by it despite recognizing its complete absence of truthful references. By design, the persuasiveness of the *Somnium* depends less on the acts of translation it invites between narrative elements and Kepler's mathematics than on the knowledge that becomes self-evident through imagining the narrative as if true.

Conjectural Probability: What is it like to go to the moon?

The *Somnium* is divided into two parts: the brief narrative and the “Geographical or, if you prefer, Selenographical Appendix,” which Kepler calls a “literary” account of his observations of the surface of the moon.²⁷ The appendix begins with an injunction that equally applies to the whole of the work, and, as we shall see in the following chapters, captures the logic of later realist fiction: “If you direct your mind to the towns on the Moon, I shall prove to you that I see them.”²⁸ While the fictionality of the “towns” is never in question, the circularity of the readerly contract illuminates an essential connection between fictional and experimental hermeneutics. The ideal fiction reader, like the ideal scientist, must be willing to admit the provisional truth of that which is yet to be known in order to gain knowledge of it. The thought experiment, as a mental exercise, belongs neither to empiricism or scholasticism, and in this instance prefigures eighteenth-century articulations of the continuum between fiction, probability, and knowledge.

There are essentially two narrative arcs in the tale. The first is the history of Duracotus, an Icelandic boy sold into maritime service by his mother Fiolxhilde. He is eventually left in Denmark and falls in with the students of Tycho Brahe and returns to Iceland to share his new knowledge. Upon reuniting with Duracotus, Fiolxhilde explains that cosmological knowledge is not foreign to Iceland, and summons a “Daemon” from the lunar kingdom of Levania. The second arc consists of the Daemon’s descriptions of how the trip between earth and the moon is undertaken (though no such trip actually occurs in the reality of the inset narrative), the topography of the moon, and its different kingdoms. All of this content is bracketed by a first-person frame narrative; the speaker recounts falling asleep after a period of studying folktale and dreaming that he discovered a volume written in the hand of Duracotus. The tale concludes when

the volume the speaker is reading is blown by a gust of wind within the dream, causing him to return to his senses. Complicating as much as illuminating matters are Kepler's meticulous footnotes, which provide a gloss of many of the tale's references to literature, his personal biography, and astronomical findings. A note, for instance, tell us that the choice of Iceland as a departure point for the moon was inspired by accounts of purgatory being located either on the moon (by Lucian) or in the caverns beneath Iceland (by the author and bookseller Georg Rollenhagen), and alert the reader to the relevant passages in the remainder of his oeuvre pertaining to observations concerning matters like the occurrence and duration of eclipses.²⁹ The notes then are both a gloss of the facts contained within the fiction, and a guide for dissecting the play between fact and fiction.³⁰

In her account of Kepler's poetics, Aït-Touati claims that fiction, in the *Somnium*, "manages a passage from acquired knowledge, that of the notes, to the unprecedented astronomical knowledge uttered in the voice of the demon."³¹ On one level, the capacity of this work to generate an air of probability surely rests in the reader's knowledge of the scenarios described as originating in the mind of a serious astronomer, so that the tale is somewhat opaque and the notes its key. But such an account does not do justice to the capacity of striking images within the text to generate belief in the truthful kernel of the text's fictional assertions. The Daemon's account of the Levanian-propelled projectile motion of humans onto the moon is one of the most richly narrated passages in the work:

Because the opportunity is so fleeting, we take few human beings along, and only those who are most devoted to us. A man of this kind, then, is seized by us as a group and all of us, pushing from underneath, lift him up into the heavens. In every instance the take-off hits him as a severe shock, for he is hurled just as though he had been shot aloft by gunpowder to sail over mountains and seas. For this reason at the outset he must be lulled to sleep immediately with narcotics and opiates. His limbs must be arranged in such a way that his torso will not be torn away from his buttocks nor his head from his body, but

the shock will be distributed among his individual limbs. Then a new difficulty follows: extreme cold and impeded breathing. The cold is relieved by a power which we are born with, and breathing is made possible by applying damp sponges to the nostrils. After the first stage of the trip is finished, the passage becomes easier. At that time we expose their bodies to the open air and leave them alone. Their bodies roll themselves up, like spiders, into balls which we carry along almost entirely by our will alone, so that finally the bodily mass proceeds toward its destination of its own accord.³²

This account of travel by demon, a method not ruled out by Wilkins, can only be understood as pure fiction, containing a distinct symbolic register. The privilege of those “devoted” to the demons is of course metaphoric of the privileged cosmological view of the true observational astronomer, while their path of travel—along the lines of light that cut past the edges of the moon during eclipses—makes clever narrative intrigue out of Kepler’s mathematical evidence for planetary motion. Some details, however, serve only to enhance readerly imagination of space travel as a concrete, and not merely conjectural, experience. The notion of shock (*violentia*) as a sensation to be distributed between limbs lest the body be torn apart, the confusing but tactile mention of sponges, and the explanation of the ease facilitated by the moon’s gravitation physicalize an otherwise mathematical or optical journey. Kepler inserts a joke through the voice of the Daemon, who informs the mother and son that “No Germans are suitable, but we do not despise the lean hard bodies of the Spaniards.”³³ The dry remark is at once a coded message directing itself to the notes, where Kepler explains that he means to draw a parallel to the terrestrial exploratory prowess of the Spanish (and this in itself would signify a latent aura of external probability), and also a provocative insinuation about the human body’s ballistic potential.

If references to the body and physical sensations do not qualify Kepler’s work as probable in the sense of verisimilar, they establish a more pronounced contiguity between the world of the human subject and the physicalized cosmos. In other words, Kepler’s introduction

of physiology into astrophysical conjecture is enacted as via the introduction of concrete possibility into the fabulous. As Aït-Touati argues of Kepler's advancement of the ancient lunar voyage, "From philosophical flight and the fabulous lunar journey we have moved to a thought-experiment in physics, conferring on fiction an ontological weight that classical and renaissance tradition did not enjoy."³⁴ Aït-Touati, as I do, hesitates to call this ontological weight by the name of "realism" (she opts for these scare-quotes), but the *Somnium* does aim, at moments, to describe what contemporary philosophers have deemed "what-it-is-likeness."³⁵ Simply, the *Somnium* portrays what it is like, as a bundle of experiential and sensuous data, to travel between the earth and moon. This gesture, fictional as it is, enables a kind of virtual knowledge of astrophysics by generating a sense of probability that toggles between external fact and the quality of the narrative.

Godwin and the Possibilities of Genre

By the end of the seventeenth century, the moon and travel thereto were more likely to be topics of satire than legitimate curiosity, especially for the English public. Scathing satires like that of Donne, as well as stage comedies like Ben Jonson's "News from the New World Discovered in the Moon" (1620) Thomas Shadwell's "The Virtuoso" (1676) and Behn's "The Emperor of the Moon" (1687) and farcical narratives like Defoe's *The Consolidator; or Memoirs of the Sundry Transactions of the World in the Moon* (1705) attest to a certain exhaustion with the moon as a topos and locus, and its relegation once again to a site of displaced terrestrial commentary. With such texts defining the parallax view of *The Man in the Moone*, its instrumentality to the spread of Copernicanism in England, and its employment of empiricist

description to do so have been largely overlooked. Though Godwin does not venture, like Kepler, to provide a probable account of the moon's topography, flora, and fauna, he does devote similar attention to the concrete details of air, space, and planetary motion as sensible phenomena. Generically, Godwin's text is practically an inversion of Kepler's. His tale is narrated in the first person as a history, and his moon is more cultivated as a site of social satire than as a hypothetical physical reality. What Godwin does retain of Kepler's vision, however, is a rich account of the journey with reference to its physical implications, and not simply its implications within the generic codes Godwin explores.

Godwin's hero, the clever but unscrupulous Spaniard Domingo Gonsales (his nationality a deliberate reference to the Daemon's remark), is the first figure in modern literature to travel to the moon by way of a mechanical contraption.³⁶ After leaving the university of Salamanca (allegedly the first university to teach Copernican astronomy) to enter the service of the Duke of Alva, Gonsales, like Thomas More's Rafael Hythloday, is left on island by a passing transatlantic voyage. On the "blessed Isle of St. Helena," out of sheer idleness, Gonsales observes the impressive size of the native fowl, which he labels "gansas," and conceives of harnessing them to one another and to a chariot:

Having prevailed thus far, I began to cast in my head how I might do to join a number of them together in bearing of some great burden: which if I could bring to pass, I might enable a man to fly, and be carried in the air to some certain place safe and without hurt. In this cogitation having much laboured my wits, and made some trial, I found by experience, that if many were put to the bearing of one great burden, by reason it was not possible all of them should rise together just in one instant, the first that raised himself upon his wings finding himself stayed by a weight heavier than he could move or stir, would by and by give over, as also would the second, third, and all the rest. I devised (therefore) at last a means how each of them might rise carrying but his own proportion of weight only, and it was thus.

I fastened about every one of my Gansas a little pulley of Cork, and putting a string through it of meetly length, I fastened the one end thereof unto a block almost of eight

Pound weight, unto the other end of the string I tied a poise weighing some two Pound, which being done, and causing the signal to be erected, they presently rose all (being 4 in number,) and carried away my block unto the place appointed. This falling out according to my hope and desire. I made proof afterwards, but using the help of two or three birds more, in a Lamb, whose happiness I much envied, that he should be the first living creature to take possession of such a device.³⁷

Godwin expands upon the program of probabilistic extraterrestrial travel established by Kepler by portraying not only what it is like to fly through space, but what it is like to conceive of, and then manifest a flying machine. Gonsales's "engine" is equal parts possible and fantastic. On one hand, it is never described in detail beyond the mention of pulleys and the specification of twenty-five birds harnessed, on the other hand we know that "laboured" his wits, learned by "experience" and exercised "reason," essentially hitting a Baconian trifecta of proper scientific practice.

The result of this science, flight by goose, was not, to the seventeenth-century reader, as categorically impossible a premise as it appears to us now. Wilkins included flight by the aid of birds in his densely annotated list of possible modes of lunar voyage in *Mathematical Magick* (1648). Though Wilkins did not believe in the literal potential of Godwin's tale, calling it a "well contrived fancy," he left the possibility of flight by fowl conceivable in consideration of a twelve-foot wing-spanned "ruck" described by Marco Polo (by the seventeenth century, however, this creature from the *Thousand and One Nights* was more associated with myth than natural history). Wilkins's work is characteristic of the period between the Copernican revolution and the publication of Newton's *Principia* (1687), which has been referred to as a "honeymoon" period for enlightenment ambition, perhaps because of and not despite the fact that the new astronomy was not accompanied by a comparable leap in mechanical engineering. This was a time, as Allan Chapman tells us, when inertia and resistance were only imperfectly understood, and thus, "there seemed no reason why a puff of breath into a toy windmill could not be torqued

up sufficiently to uproot an oak tree or power a flying machine.”³⁸ Thus, flight, and by extension, the flying machine were greeted with the most enthusiasm (and deemed most probable) in the earliest and vaguest stages of conception.

Not only mechanical inventions, but science in general over the course of the seventeenth century was defined by a gap between existent and not-yet-existent knowledge. The full title of Wilkins’s astronomical study, *A discovery of a new world, or a discourse tending to prove that 'tis probable there may be another habitable world in the moon*, speaks to the rising provenance of the epistemological territory between fiction and certitude. Through the early eighteenth century, the term “probable” could mean both “approvable” (according to canons of authority, textual and testimonial) and “likely.”³⁹ Wilkins’s project plays upon both these meanings, directing the reader to consider a conglomeration of possibilities as amounting to something less than proof, but more than mere opinion. The turn to the probable as an elevation of the possible is necessary in the defense of Copernicanism because, in contemporary science, the Copernican hypothesis could not be demonstrated with any of the certitude of sensory or mathematical data and was thereby decidedly *improbable*.⁴⁰

Godwin’s narrative, like Kepler’s, fabricates a condition of knowledge that is modeled after empirical verification despite this epistemology’s inapplicability in the matter. Gonsales’s first person narration provides a surrogate account of flight that is rendered more credible by the awe he shares with the reader. The voyage to the moon is intended as an escape from a naval engagement (after Gonsales and his gansas have been picked up by a passing ship), in which the birds, having been trained to fly towards a white flag, take off in the direction of the peak of Tenerife and continue flying into space. This incredible development is apparently, for the birds, ordinary and habitual,

It was now the season that these Birds were wont to take their flight away, as our Cuckoos and swallowes doe in *Spaine*, towards the Autumne. They (as after I perceived) mindfull of their usuall voyage, even as I began to settle my selfe for the taking of them in, as it were with one consent, rose up, and having no other place higher to make toward, to my unspeakable feare and amazement strooke bolt upright, and never did linne towring upward, and still upward, for the space, as I might guesse, of one whole hower; toward the end of which time, mee thought I might perceive them to labour lesse and lesse; till at length, O incredible thing, they forbare moving any thing at all! and yet remained unmoveable, as stedfastly, as if they had beene upon so many perches, the Lines slackd; neither I, nor the Engine moved at all, but abode still as having no manner of weight.⁴¹

The interspersing of empirical detail and recorded sensory data with apostrophe and expressions of amazement are characteristic of “history” writing at the time, a rhetoric that McKeon has called “strange, therefore true.”⁴² Gonsales’s narration of his own passage between ignorance and knowledge (“as after I perceived”) of the extraterrestrial character of his birds casts the event as a didactic experience. No claim is made to systematic knowledge, only to experience and impression. And in this case, Godwin plays upon a more widely accepted thesis, William Gilbert’s inverse relationship of distance and magnetic force as elucidated in *De Magnete* (1600), to retain an air of scientific probability (as approvability) within the playful fiction.⁴³

Gonsales’s skepticism continues to enact itself as a reliance on empirical observation in the midst of the implausible, hence his partial acceptance of Copernicus:

I will not go so farre as *Copernicus*, that maketh the Sunne the Center of the Earth, and unmoveable, neither will I define any thing one way or other. Only this I say, allow the Earth his motion (which these eyes of mine can testifie to be his due) and these absurdities are quite taken away, every one having his single and proper Motion onely.⁴⁴

Though Godwin himself did endorse this same limitation of the earth’s movements to diurnal rotation, the observation does not come necessarily at the expense of the other movements. Meanwhile, the rhetoric of strict reliance on visual verification bolsters the anti-Ptolemaic agenda by stressing the observation’s generation in the experience narrated rather than external discourse; the occasion of his seeing is proof enough. And of course, his fictional

observation readily translates into a replicable earthly practice: observing oneself to be passing around the sun. Godwin also borrows from Kepler a provocative moment of narration describing the rotating earth as itself, a complete object comparable to the full moon as seen from earth. Kepler's *Daemon* describes his view of "Volva" (Earth) in a series of simple but defamiliarizing images: Europe and Scandinavia are "a young girl in a long dress, who stretches her hand back to attract a leaping cat," South America is "a bell hanging from a rope and swinging westward." In Godwin's version, Africa is "a pear that had a morsel bitten out upon the side of him," and more explicitly the earth appears as "no other than a huge mathematical globe," which is to say the Earth looks like a map of itself.⁴⁵

The earth, in these passages of description, attains the same tautological identity, and status as proof, as Kepler's towns on the moon. The fabricated view from nowhere assumed by cartographers becomes an embodied view, and in this sense extraterrestrial travel becomes not only possible but necessary (as "proof" of maps), at least as credible as cartography.⁴⁶ That is to say, these episodes highlight the probabilistic bases of more familiar forms of knowledge, and in insisting upon empiricist epistemology, subvert both scholasticism and empiricism as total paradigms. The calling to mind of a familiar image further completes the operation of virtual witnessing, the goal of which, as Schaffer and Shapin indicate, is "the production in the reader's mind of such an image of an experimental scene as obviates the need for either direct witness or replication."⁴⁷ Though Boyle's program of virtual witnessing relied significantly on the inclusion, in his published treatises, of precise illustrations of his devices, virtual witnessing need not be understood as a strictly visual paradigm. Indeed, though the Royal Society experimentalists and other empiricist epistemologists such as Locke regularly claimed to favor

plain signification over rhetorical flourish, intense and vivid description would be used through the seventeenth and into the eighteenth century to impress ideas into the readerly imagination.⁴⁸

In Kepler's and Godwin's descriptions of the Earth as a planet, they employ what may be called hypotyposis, defined by Quintillian as "any representation of facts which is made in such vivid language that they appeal to the eye rather than the ear."⁴⁹ The salient feature of hypotyposis in this case is that it does not only describe an object vividly, but 1) does so in a way that captures the object's motion in time and 2) further emphasizes the physical (bodily) conditions to which the representation belongs. The visual accuracy of these descriptions, which could only be established by the confirmation of contemporary maps that were known to be imperfect representations of the earth, is irrelevant compared to the action of producing them. The evidential function of these narratives rests in a unique and masterful imbrication of vivid description—an accepted means of communicating empirical truth—and narration, a defining feature of fiction.

Imaginary and Narrative Evidence

While Susan Stewart asserts that "all description is a matter of mapping the unknown onto the known,"⁵⁰ Kepler's and Godwin's evocations of the cartographical view to illuminate the cosmological demonstrate, quite literally, the reverse, that is, the mapping of the known onto the unknown. Description, in these texts, does the work of convincing, of mediating between the already known, the newly discovered, and the possible. Merging the structure of the scientific observation with that of the imaginary description, these texts mark an overlap in description's classical function, to display knowledge, and its modern one, to serve narrative. This a broad

history of course, and the subject of a wave of recent critical study; the work of historicizing the role and meta-discourse of description has been capably undertaken by Philippe Hamon, while more recently studies by Bender, Cynthia Wall and Joanna Stalnaker have focused on prose description's ubiquity in the eighteenth century. The point of departure for my engagement with the history of description is that, while prose description is today understood as an essential element of the literary, through the renaissance and early modern period it was aligned much more strongly with the domain of knowledge than the domain of imagination. Across literary history, description is understood axiomatically as that which is not narrative; and indeed, while Hamon's project orients itself consciously against the oversimplification of Lukács's "Narrate or Describe" (where, Lukács's interest being in nineteenth-century Realism, the former is considered hierarchically above the latter), he still admits to a reliance on the field of narratology for his structural understanding of description.⁵¹ Stalnaker, for her part, argues for the advent of modern novelistic description as a repurposing of natural "history" writing, born out of the inherent failure of description's capacity, in itself, to convey knowledge of a given object.

We may look at the texts discussed here through the lens of description's deficiencies, to the degree that they both illuminate scientific principles already meticulously described, and withhold as much visual description as they provide. Godwin's evocative but minimal explanation of his flying machine, for instance, reflects the fraught contemporary debate over the ends of description in establishing matter of fact. While Schaffer and Shapin note, on one hand, that detailed and accurate descriptions of his famous air-pump's function were integral to Boyle's intent of proving its efficacy, no experimenter in Europe produced his own *machina Boyleana* from textual description alone, that is to say, without visual experience of the device.⁵² This distinction between the evidentiary and utilitarian quality of description appears in

Godwin's text, in two brief nods to contemporary experimental culture. Godwin promises to the reader to provide a "description" of his engine, one presumably more exact than the suggestive few details that appear in the narration, at some "ensuing" point that never arrives. He does, however, offer a proper demonstration to Alphonso de Xima, his rescuer from the island:

Unto him I opened the device of my Gansa's, well knowing how impossible it were otherwise to perswade him to take so many Birds into the Ship, that would bee more troublesome (for the nicenesse of provision to be made for them) then so many men; Yet I adjured him by all manner of Oaths, and perswasions, to afford mee both true dealing, and secrecy. Of the last I doubted not much, and assuring my selfe, he would not dare to impart the device to any other, before our King were acquainted with it. Of the first I feared much more, namely, lest Ambition, and the desire of drawing unto himselfe the honour of such an invention, should cause him to make mee away.⁵³

Of course visual description of the earth's surface and technical description of a flying machine evoke different registers of the term, but here it is telling that one is included in the text and the other conspicuously concealed. The engine, or device, as I have mentioned before, is described in the text with enough detail to conceive of it realistically as the product of ingenuity and as the literal engine of the plot. But, like Charles Bovary's hat (which is for theorists like Hamon the emblem of modern description's vexed relationship to verisimilitude), it is rendered as specific without being specifically imaginable as itself. I above indicated that, for the reader, the barest mention of the engine's having been engineered is all the gesturing necessary to place it within the realm of possible objects. But for the (overwhelmingly amateur) scientific community of the time, for whom captain Xima stands in, the value of the device lies only in its capacity to be explained entirely and thereby rendered duplicable. Godwin's tongue in cheek nondisclosure to his audience, when held up against Gonsales's strictly regimented exchange with de Xima, reveals description's affinity, as a practice, with science in comparison to its marginality within literature.

Description functions in Godwin's fiction in a manner largely consistent with the function of description in the non-fictional texts to which it refers. Gonsales's explanation of the working of his engine, like Godwin's hypotypotic passage on the revolving earth, is employed in the project of demonstrating knowledge and ultimately, of convincing. For Hamon, poetic or literary employment of description, through the eighteenth century, is derivative of utilitarian description; where it exists aesthetically, it is imported from some exterior practice (economic, military, or antiquarian, for instance).⁵⁴ In the mid-eighteenth century, the encyclopédistes Louis de Jaucourt and Edme-Francois Mallet, in their entry for the term, make a distinction between "description" as a practice, the examples for which are topography (description of places) and chronography (description of time), and "descriptions," where the latter plural noun form, by contrast, refers to verbal and poetic acts that "present images of objects in time."⁵⁵ Sneaking cartography into narrative as visual experience, Kepler and Godwin combine these distinct registers (which, being eighteenth-century inventions, do not contextualize, but illuminate the case at hand). Their employment of description is both bound to the intrigue of fictional narrative and aware of itself as the locus of knowledge. It is in the descriptive passages of these texts that the epistemologies proper to literature and science appear as overlapping but emergently distinct.

In both instances, the work of "description" proper is absent from the pages of the narrative; the descriptive function in Kepler's text, according to the encyclopédistes' definition, is performed by the notes (the paradigmatic medium of early modern description, for Hamon), while in Godwin's text it is either conspicuously absent, as in the offstage mechanical demonstration, or liminally present, as in Gonsales's repeated use of the inexpressibility topos in recounting some of the more magnificent qualities or objects of the lunar people. The proliferation of empirical details that make up a large part of Gonsales's account of his time on

the moon consciously evoke the form of travelogues like John Smith's *A Description of New England* (1616) and Gerrit de Meer's *A true description of three voyages by the north-east towards Cathay and China* (1596). The most important textual influence on *The Man in the Moone*, outside of *Utopia*, is widely understood to be the Jesuit missionaries Nicholas Trigault and Matteo Ricci's *Histoire de l'expedition chrestienne au royaume de la Chine* (1610). Grant McColley has convincingly dated Godwin's writing "unquestionably after 1615 and probably during the years 1627-1628" on the basis of historical allusions in the text, but more tellingly, on apparent borrowings from Ricci and Trigault.⁵⁶

Where Godwin sounds most like the writer of an earnest seventeenth-century "Description" or "History" is when he is plainly satirical. Not surprisingly, Godwin's text is most visible now—within histories of the genre of science fiction—as a source for Swift's *Gulliver's Travels*, in particular the third part, in which Gulliver recounts his visits to "Laputa, Balnibarbi, Luggnagg, Glubbdubdrib and Japan." Both of these fantastic journeys are bracketed by an encounter with the terrestrial Orient; Gonsales lands in China upon his return flight while Gulliver returns home for the third time onboard a Dutch trade ship from Japan. Though Swift's satire of the contemporary culture of science, and the Royal Society in particular, provides some of the richest insight into his personal philosophy, part three has largely been treated as the weakest in *Gulliver's Travels* on account of the unwieldiness of its marriage between satire and narrative, which is to say description and narrative. Swift's Gulliver, like Godwin's Gonsales, integrates—more so, for instance, than More's Hythloday—details relating to the passage of time, the logistics of his movements, and his personal disposition while providing topographic and anthropologic observations, but these details mark themselves as parodic in their vestigial reference to the genre of non-fiction exploration narrative amidst a

manifestly fictional progression of social satires. Similarly, in Godwin, Gonsales's arrival on the moon effectively disrupts the picaresque heroic arc of the early narration, and renders his invention a literal plot device, enabling an extended stasis within the mock-descriptive mode before a brief *Crusoe*-like flurry of action (an escape from China) to conclude. While it would be a different project entirely to parse the manifest orientalism of these texts, I posit that the appearance of Japan and of China appear, ironically, in order to establish the probabilistic continuity between the real and the fantastic (to map the unknown onto the known), and ultimately constitute a skeptical backlash to the objective posture of the genre of "description" by making light of the diverging ends of description in fiction and nonfiction.⁵⁷

Cavendish, Hobbes, and the Form of Assent

Within the literary tradition of imaginary travel as scientific experiment in the seventeenth century, the logic, later to be crystallized by Fielding and Walpole—to "allow the possibility of the facts" and recognize the "truth" of the narrative from that axiom—is already firmly in place. If Kepler's injunction to "direct your mind" playfully hints at this logic, the concluding remarks of Margaret Cavendish's *The Blazing World* (1666) make it explicit. Marjorie Hope Nicolson, one of the first critical historians of the seventeenth-century extraterrestrial travel narrative, treats Cavendish's entry as the height of the genre, not for the elegance of its engagement with contemporary science, but for the depth of its world-building in combination with its spirited defense of fiction. Like the texts discussed above, *The Blazing World* consists of long passages of descriptive stasis, but, at its best, integrates the visual intrigue of its scenes with the embodied experience of its two heroines.

To briefly summarize the plot, a woman is abducted onto a boat that sails to the earth's north pole, killing the kidnappers and transporting the woman, via a waterway that runs between the planets' contiguous poles, to another planet. This planet is inhabited by a seemingly infinite number of species combining attributes of men with attributes of earth animals (for instance bear-men and fly-men), each of whom partake in different vocations, all of which are in some way related to observational science, in imitation of Royal Society divisions of knowledge.⁵⁸ The woman marries the Emperor of the Blazing World to become empress, and uses her power, bolstered by the explosive technology of her planet to aid her home country of ESFI (which appears very much like England) in a naval engagement. The latter stages of the narrative concern the Empress's friendship with the Duchess of Newcastle (Cavendish's actual title, which, of course, in lieu of her proper name was advertised on the original title page and dedicatory verses; her preface "To all Noble and Worthy Ladies" is signed "M. Newcastle"), who is reported to be "most learned, eloquent and witty," and the two of them communicate through the conference of their immaterial souls and conduct experiments in world-building. Cavendish concludes with an astounding epilogue, which refrains from ontologically parsing her intra- and extradiegetic worlds, while affirming the basis of fiction in "Creation":

By this Poetical Description, you may perceive, that my ambition is not onely to be Empress, but Authoress of a whole World; and that the Worlds I have made, both the Blazing- and the other Philosophical World, mentioned in the first part of this Description, are framed and composed of the most pure, that is, the Rational parts of Matter, which are the parts of my Mind; which Creation was more easily and suddenly effected, than the Conquests of the two famous Monarchs of the World. Alexander and Cesar. Neither have I made such disturbances, and caused so many dissolutions of particulars, otherwise named deaths, as they did...if any should like the World I have made, and be willing to be my Subjects, they may imagine themselves such, and they are such, I mean in their Minds, Fancies or Imaginations; but if they cannot endure to be Subjects, they may create Worlds of their own, and Govern themselves as they please.⁵⁹

Putting aside, for the moment, the two most conspicuous elements of Cavendish's rhetoric: the analogy of authorship with political sovereignty and the gendering of her own non-violent authority, this passage, and *The Blazing World* generally, propose a surprising relationship between knowledge and belief, especially in light of the its publication alongside Cavendish's *Observations upon Experimental Philosophy* in 1668. Like Kepler's *Somnium* and its notes, Cavendish's fiction/natural philosophy pairing gestures more-than-superficially at a hierarchical division between the realms of scientific learning and imaginative fancy, but more so even than Kepler's, Cavendish's fiction erodes the premises of that distinction. For instance, where Kepler packaged his own scientific views within a narrative frame designed to highlight their implications, Cavendish's story mingles elements of her actual philosophy with elements that contradict it, all in service of an epistemology privileging assent over authority.

A few elements of Cavendish's quasi-vitalist materialism (heterodox for the time) appear in *The Blazing World*. More than half of the text consists of the Lady's/Emperess's interviews with the various creatures who are experts in different fields of science. These interviews make up the bodies of paragraphs that span pages, consisting of sequences of questions and answers separated by only the barest bits of narration (e.g. "then," "after this," or "this answer pleased the empress"). Very little reliable indication may be found, within the text, of a claim's relation to an actual opinion of Margaret Cavendish; the empress at times approves or disapproves of specious testimony offered by the blazing world's experts, or the narrative voice registers the Empress's opinion for the reader as objective. For instance, in this exchange with the Bird-people, experts on celestial bodies:

Then the Empress asked them the reason, Why the Sun and Moon did often appear in different postures or shapes, as sometimes magnified, sometimes diminished; sometimes elevated, otherwhiles depressed; now thrown to the right, and then to the left? To which

some of the Bird-men answered, That it proceeded from the various degrees of heat and cold, which are found in the Air, from whence did follow a differing density and rarity; and likewise from the vapours that are interposed, whereof those that ascend are higher and less dense then the ambient air, but those which descend are heavier and more dense. But others did with more probability affirm, that it was nothing else but the various patterns of the Air; for like as Painters do not copy out one and the same original just alike at all times; so, said they, do several parts of the Air make different patterns of the luminous Bodies of the Sun and Moon: which patterns, as several copies, the sensitive motions do figure out in the substance of our eyes.

This answer the Empress liked much better then the former, and enquired further...⁶⁰

It is rather unclear here whether the Empress's pleasure determines or is determined by the "probability" of the testimony. That is to say, the argument produced by the contesting group of birdmen could either have convinced her through its logical rigor (so that she assents to the general air of probability it conveyed to the whole of the company present), or its being worthy of assent is the tautological equivalent of her assenting to it. To be sure, Cavendish does not resist having the Empress echo her own beliefs and criticisms about the state of scientific inquiry. She listens approvingly to accounts of the worm-men's vitalistic atomism; likewise, she scoffs at the bear-men's spurious findings through the use of telescopes, and their exculpating admission that they "take more delight in Artificial delusions, than in Natural truths."⁶¹ But more important to Cavendish than demonstrating, through philosophic dialogue, the validity of her own ideas is presenting epistemology as a subject-oriented rather than an object-oriented pursuit.

Cavendish, as both the first woman to be admitted into a meeting of the Royal Society, and an admirer of its most vocal critic, Thomas Hobbes, writes into the *The Blazing World* an epistemological counter-model to both the Boylean paradigm of accrued virtual witnessing and the Hobbesian paradigm of axiomatic natural knowledge. In their semi-public debates over the efficacy of the air-pump, Hobbes, bitter at not having been among the fifty to witness the air-

pump's first demonstration in person, scrutinizes Boyle's claims to certainty on the basis of this manner of proof. At the same time, however, that fifty men is too few to lay claim to a privileged understanding of natural philosophy, it is also unnecessarily many. Both Boyle and the Royal Society's historian Thomas Sprat consistently referenced the English justice system as a model for their practice, with Boyle specifically seizing upon the Treason Act of 1661, which called for the testimony of two witnesses to convict.⁶² The multiplication of witnesses (and, if possible, the multiplication of experimental results) could thus proportionally increase the probability of accuracy, and indeed, certainty was understood by Boyle and his colleagues to form one end of a spectrum of probability. A key metric of this spectrum was honor, much in the manner of English social politics. The men of the society (who would routinely refer to one another as "the ingenious Mr. ____") and the data they produced and disseminated could reciprocally endow honor and certainty, respectively, upon one another. Because this was precisely in concordance with legal and clerical procedure, the Royal Society admitted such hierarchical principles even within its stated program of decentering the collection of knowledge.⁶³ Hobbes had made his position clear on the matter in *Leviathan* that while witness testimony could validate occurrences, it could not be used to establish scientific knowledge:

There are of Knowledge two kinds; whereof one is Knowledge Of Fact: the other Knowledge of the Consequence of one Affirmation to another. The former is nothing else, but Sense and Memory, and is Absolute Knowledge; as when we see a Fact doing, or remember it done: And this is the Knowledge required in a Witness. The later is called Science; and is Conditionall; as when we know, that, If The Figure Showne be a Circle, then any straight Line through the Centre shall divide it into two Equall Parts. And this is the Knowledge required in a Philosopher; that is to say, of him that pretends to Reasoning.⁶⁴

This is Hobbes's "positive" argument against the authority of the witness and of experimental demonstration as a practice: that the deduction of natural principles can only be accomplished through reason generally, and mathematics specifically. Thus the multiplication of witnesses

becomes an unnecessary fabrication of an inherently politicized body of knowledge. In the “*Dialogus Physicus*,” Hobbes asks his interlocutor why fifty men viewing a single object should be necessary to advance knowledge of nature: “Those experiments you see in the meetings, which experiments are indeed known to be few, you will believe to be sufficient; but are there not enough, do you think, shown by the high heavens and the seas of the broad earth?”⁶⁵ The template for the progression of scientific knowledge, for Hobbes, proceeds from observation, which all men are capable of, through the universal faculty of reason. Laws of nature can only be understood as such because they are already formatted to human understanding. Thus, gathering men to observe a convoluted contraption is an exercise in vanity, as each man could access his memory to reach the conclusion that vacuums do not occur in nature, and furthermore prove this fact mathematically.

Cavendish’s empress, like Hobbes, is skeptical both of the bear-men’s instrumentally collected knowledge and their corrupted manner of evaluating their findings through concurrence with one another. But the Hobbesian counter-model, the appeal to the universal faculty of reason, appears equally unappealing. In perhaps the most astounding passage in *The Blazing World*, the fictionalized Duchess of Newcastle, under the guidance of the empress, endeavors to create her own world, out of the material of her imagination. Proceeding through different accounts of the universe’s material form from the pre-Socratics through her contemporary Hobbes, the Duchess finds herself unable to inhabit any of the worlds she conjures because her manifestations of them are at odds with her personal comfort:

At last, having with much ado cleansed and cleared her mind of these dusty and misty particles, she endeavored to create a World according to Aristotle's Opinion; but remembring that her mind, as most of the Learned hold it, was Immaterial, and that, according to Aristotle's Principle, out of Nothing, Nothing could be made; she was forced also to desist from that work, and then she fully resolved, not to take any more patterns

from the Ancient Philosophers, but to follow the Opinions of the Moderns; and to that end, she endeavoured to make a World according to Des Cartes Opinion; but when she had made the Æthereal Globules, and set them a moving by a strong and lively imagination, her mind became so dizzie with their extraordinary swift turning round, that it almost put her into a swoon; for her thoughts, but their constant tottering, did so stagger, as if they had all been drunk: wherefore she dissolved that World, and began to make another, according to Hobbs's Opinion; but when all the parts of this Imaginary World came to press and drive each other, they seemed like a company of Wolves that worry sheep, or like so many Dogs that hunt after Hares; and when she found a re-action equal to those pressures, her mind was so squeezed together, that her thoughts could neither move forward nor backward, which caused such an horrible pain in her head, that although she had dissolved that World, yet she could not, without much difficulty, settle her mind, and free it from that pain which those pressures and reactions had caused in it.⁶⁶

Following these attempts, the Duchess ultimately resolves “to make a World of her own Invention,” consisting of “rational and self moving matter.” Unsurprisingly, this world’s perfect amicability to the Duchess’s sensibilities “cannot possibly be expressed by words,” nor can the world itself. Here Cavendish makes light of cosmological discourse’s reliance on analogy through the literalization of abstract imagery, and, in the case of Hobbes, makes sport of his cosmology’s basis in political fatalism. But the underlying joke is perhaps even simpler, that all descriptions of the world describe the same world; the world the Duchess manifests will ultimately have all of the same physical properties as the two (Earth and the Blazing World) with which she is familiar. All that is really at stake is her understanding of it through description, which would be both impossible and beside the point.

Prehistoricizing Narrative Probability

I have argued that modern (seventeenth-century) astronomical or cosmological fiction differs from its ancient predecessors in its attention to the physical conditions of travel between worlds, which I see as a manifestation of its interest in communicating facts. These fictions

gesture at facts outside of themselves through the creation of scenarios in which those facts are evident. In making light of the game of representation that natural philosophy may be reduced to, and disambiguating the imaginative work of fiction reading and writing from scientific knowledge proper (which itself remains elusive), *The Blazing World* emphasizes the capacity of fiction to rival or even subsume actual sensation as an epistemological basis. This power must thus be wielded ethically if not explicitly recused. Cavendish's final plea is for a freedom from the association of fiction and truth rather than the freedom to express any truth (that is, the freedom Kepler recognized in the turn to fiction). In satirizing the epistemology of internal consistency, she invites the emergence of what we now understand unproblematically as fiction, whose paradigmatic form will be the novel.

In Kepler and Godwin, who both narrativize scientific discovery and tether precarious scientific knowledge to plausible fiction, scientific conjectures that had hitherto suffered for the nature of their evidence are refigured as being—as I have characterized the matter at various points—self-evident. Self-evidence is, Schaffer tells us, “a gesture which refers to the immediate appeal of the fact itself,” the form of evidence that “carries the rhetorical sense of vividness.” Defined negatively, it is, as Schaffer argues, a fundamental counter-model to what is now recognized as conventional evidence, which Ian Hacking helpfully characterizes as “a gesture beyond the fact to some other state of affairs.”⁶⁷ Such hierarchical and penetrative movement “beyond the fact” is the essential characteristic of the experimental method championed by Bacon and instantiated by Boyle and the Royal Society. By this understanding, phenomena as far outside the limits of current scientific understanding as the sighting of a demon could fall within the domain of fact, a fact both despite and revelatory of a general lack of knowledge. Self-

evidence, on the other hand, supposes a kind of collapsing between fact and the knowledge with which it is associated.

It is an inverted self-evidence that Domingo Gonsales invokes in his injunction that the reader “grant the earth its proper motion.” In his narrative proof of the earth’s rotation, Godwin deliberately reverses the evidential significance of his hero’s experience; that Gonsales sees the earth rotate does not gesture at the earth’s rotation as a principle, but rather, ought to retroactively refigure the reader’s own cosmological model and thus confirm what he already knows. This application of the logic of self-evidence is potent, for it enables the supplementation of experimental or experiential evidence with other forms, both mathematical and fictional, that may alter the significance of empirical facts. In the case of Kepler’s *Somnium*, this double substitution is diagrammed practically in its entirety between the narrative and notes, without appeal to an external corpus. And finally, in Cavendish, the necessarily centrality of the experiencing subject to the efficacy of evidence is made manifest, so that the recognition of one explanatory model over another becomes a matter of personal sovereignty. And here we encounter another divergence in the logic of self-evidence, according to whether the “self” refers to the phenomenon or the subject.⁶⁸ While this division seems to lend itself easily into a distinction between science and fiction, respectively, these forms may just as easily be seen as different but equally valid appeals to the domain of affairs “beyond the fact.”

To return to the question of probability, these works attest to the porosity of the categories of “internal” and “external.” These categories, and their persistent instability, will be discussed in greater detail later in this study. Generally, however, we might conceive of external probability as referring to a sense that a narrative is consistent with the facts and rules of the actual world, while internal probability operates according to Locke’s “consistency of parts.”

Such categories, to the degree that they ever become truly meaningful in relation to fiction, can only become so against an understanding of fiction whose default mode is some version of probabilistic “realism.” To arrive at this point, a species of fiction that earnestly promotes external probability as its only probability, by presenting the propositions of its fiction as facts about the actual world, must exist. This mode of fiction is more or less typified by the naïve empiricism of the early English novel, and, as we shall see in the following chapter, an impetus for its development is the mediation of scientific questions. The narratives discussed in this chapter, however, also mediate (to varying degrees) scientific questions, though without any investment in the appearance having actually occurred.

The question of the external is very much beside the point of the *Blazing World*, which, despite placing many of Cavendish’s own genuinely held scientific beliefs in the mouth of the empress, is ultimately most committed to freedom of representation, on the grounds that all representations of physical reality function, to some degree, according to the consistency of their own parts. To the degree that any may be deemed probable, it is in the pleasure of this consistency, which implicitly displaces another classical canon of probability: the authority of the author. Whether the systems proposed by Lucretius, Descartes, Gassendi, or Hobbes are probable, is, for the empress and her “friend” the duchess, a question of which system is amenable to their imaginations, but not, however, a question of which of these men ought to be held in the most esteem (diegetically, because there is no clerical or university system in the *Blazing World* that would have the power to compel them to accept any particular school). Having isolated the question of probability to the domain of the personal rather than political (this isolation belonging to the ideal world of the fiction and not referring to the intellectual climate around the historical Cavendish), Cavendish further suggests its complete internalization,

explicitly likening the acceptance of a natural philosophy to the acceptance of a fiction, and further defining that acceptance according to the metric of enjoyment or comfort. We might presume that the comfort of the duchess in adopting a model of the physical universe is, to some degree, a measure of its suitedness as representation to the world as it is—the acceptance of a representation according to its external probability—but the mechanics of this judgment are beyond any normative discussion.

If Cavendish presents an extreme case of bracketing the world of fiction from the actual physical world, Kepler and Godwin attempt a middle probability, in which dream and picaresque narratives are, in moments, susceptible to interpretation relative to their accuracy in depicting actual world phenomena. In the chapter that follows I will examine the contours of the high-profile debate in late-seventeenth-century England over the particular dynamics by which facts could be related to underlying bodies of knowledge, and in particular how these debates ultimately revolve around questions of narrative. It is my goal to illuminate how, even in narratives that claim to be constructed according to external (that is, non-aesthetic) laws of nature, if not historical events, the form of the narrative still holds more control over the evidential significance of its contents than the other way around.

Notes

¹ John Bender “Enlightenment Fiction and the Scientific Hypothesis” *Representations* 61.1 (1989) 6-28.

² See Michael McKeon “The Dramatic Aesthetic and the Model of Scientific Method in Britain, 1600-1800,” *The Eighteenth-Century Novel*, Vols. 6-7: *Essays in Honor of John Richetti* eds. Albert J. Rivero and George Justice (New York: AMS Press, 2009) 197-259

³ See Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 2011) esp. 165-209 and Richard W. F. Kroll, *The Material Word: Literate Culture in the Restoration and Early Eighteenth Century* (Baltimore: Johns Hopkins University Press, 1991)

⁴ The full title of Kepler’s work is *Somnium, seu Opus posthumum de astronomia lunari*

⁵ Later in this chapter I adopt Grant McColley’s estimation that the work was composed sometime in the late 1620’s. McColley, “The Date of ‘Godwin’s Domingo Gonsales” *Modern Philology* 35.1 (1937) 47-60

⁶ Patey attributes his usage of the term ‘plausible’ to the nineteenth-century rhetorician George Campbell, who distinguishes it from the category of the probable by virtue of its lack of reference to actual fact. Plausible accounts are those that produce a sense of truth through their internal consistency, rather than by external guarantors like witness testimony or recorded data. In Locke’s *Essay*, “the consistency of parts” is named among criteria of probability, and as Patey notes, in the late fifteenth century Rodolphus Agricola argued in favor of the accommodation of that which is “congruent with the matter” to Aristotle’s hierarchy of probable testimony. I use the term “plausible” rather than “probable” for now in order to reflect this original distinction. I address at greater length the application of Locke’s “consistency” to fictional world building in chapter four. See Patey 25

⁷ Koyré, *From the Closed World to the Infinite Universe* (Baltimore: Johns Hopkins University Press, 1957) 3

⁸ On this point, the opinions of Cavendish’s heroine in *The Blazing World* are characteristic of a common discourse: that instrument-enabled observations were in fact false observations *produced* by instruments, and illogical starting points for knowledge in any case because they did not fall within the sphere of man’s natural capacity for observation.

⁹ Joseph Glanvill, *Saducismus Triumphatus* (London:1689) 62-73.

¹⁰ See McKeon’s discussion of apparition narratives in *Origins of the English Novel* (Baltimore: Johns Hopkins University Press, 1987) 83-87, as well as Riccardo Capoferro, *Empirical Wonder: Historicizing the Fantastic, 1660-1760* (Bern: Peter Lang, 2010) 100-103. The problem of credibility in empiricist narrative is taken up at length in chapter two.

¹¹ Koyré somewhat underplays his importance to the new astronomy on this account, as he did not partake in the so-called breaking of the spheres. But, as Paul Oskar Kristeller argues, “Even if we want to say that Kepler discovered the laws in spite of, and not on account of, his Platonist cosmology, as historians we cannot be concerned only with those parts of his work and thought that have been accepted as true by later scientists.” *Renaissance Thought and its Sources* ed. Michael Mooney (New York: Columbia University Press, 1979) 164.

¹² See Michel Foucault, *The Order of Things* (New York: Vintage Books, 1994) Ch. III and IV.

¹³ Descartes explains, ““when I imagine a triangle, even if perhaps no such figure exists outside my thought anywhere in the world and never has, the triangle still has a certain determinate nature, essence, or form which is unchangeable and eternal, which I did not fabricate, and which does not depend on my mind.” *Discourse on Method and Meditations on First Philosophy* trans. Donald Cress (Indianapolis: Hackett, 1998) 88

¹⁴ Rudiger Campe, “Shapes and Figures—Geometry and Rhetoric in the Age of Evidence” *Monatshefte* 102 (2010) 288-289

¹⁵ Various iterations of the bracketed reality of fictional worlds are discussed in chapter four.

¹⁶ By “daemon,” Kepler means something more like “extra-terrestrial,” where the nomenclature is intended as a subversion of Christian and pagan superstition.

¹⁷ See Sarah Hutton “*The Man in the Moone* and the New Astronomy: Godwin, Gilbert, Kepler” *Études Epistème* 7 (2005) 3-14

¹⁸ Ian Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas About Probability, Induction and Statistical Inference* (London: Cambridge University Press, 1975), 52-54. Long observation is the term Hacking applies to the practice of acquiring knowledge through repetition of a scenario. He points specifically to two triumphs of long observation in the sixteenth century, before the advent of the statistical formulas that are now understood to govern games of chance: that poker players know a flush to be slightly rarer than a straight, and that dice players know ten and eleven to be a better bet than twelve for a roll of three dice. This common gambler’s knowledge would later be proven to correspond to subtle differences in odds that could not yet be calculated mathematically. Kepler is especially interesting in this light because his emendations to astronomy are rooted in mathematics, but he appears to recognize the authority of acquired observational knowledge and thus seeks to recreate it in the controlled setting of fiction.

¹⁹ For a perfectly illustrative example see Roger Bozzetto and Arthur B. Evans, “Kepler’s ‘Somnium’; Or, Science Fiction’s Missing Link” *Science Fiction Studies* 17.3 (1990) 370-382, but versions of this claim also appear in specialized studies such as Marjorie Hope Nicolson’s (see below) as well as Mary Blaine Campbell, *Wonder and Science: Imagining Worlds in Early Modern Europe* (Ithaca: Cornell University Press, 2004)

²⁰ Margaret Cohen, *The Novel and the Sea* (Princeton, N.J: Princeton University Press, 2013). “Practical reason” is the term Cohen uses to describe the particular facility of the maritime explorer throughout the work. As she explains briefly in her introduction, and henceforth in a series of endnotes, her sense of practical reason is derived from the concept of *metis*, specifically in its contentious relationship to the concept *virtu*, the emblem of the former being Odysseus and the latter the medieval knight. A crucial distinction between modern practical reason and classical *metis* is that, “*Metis* imitates the wiles of the gods rather than distinguishing human agency, as in modernity.... [and] *metis* is pervaded by the classical respect for the limits of the human condition and human knowledge” (241, n.106). Gonsales’s employment of *metis* diverts from that of Odysseus in two ways: whereas Odysseus does not pass through the Pillars of Hercules, Gonsales does transcend the human world, and, while Odysseus consciously self-regulates, Gonsales, far more *picaro* than hero, “trespasses” accidentally. Thus one distinction ironizes the other, reflecting not only the evolution of practical reason as an ideal, but also a central claim of the new astronomy, that is, the ontological non-distinction between the world of men and the space beyond.

²¹ The Christianity of the Lunars seems incongruous with their physical removal from Earth and their ontological difference from humans, not unlike their affection for the Queen of England, which a seventeenth-century reader could accept much more comfortably as a joke. One explanation is that the Lunars, who call themselves Christians

but are unfamiliar with the name of Mary, may be a kind of pre-lapsarian, pre-Catholic Christians. In any case, the vague, underexplored Christianity of the Lunars exempts Godwin from engaging with either of two blasphemies entailed by a plurality of inhabited worlds: that the sacrifice of Christ did not save the universe but only a fragment of it, or that there are multiple or infinite Christs. As William Poole notes in his introduction to the Broadview edition of Godwin's text, a contemporary French translator avoided the references to Christianity altogether. He remarks however that Godwin's lunars "feel distinctly human" next to Kepler's non-anthropomorphized lunar creatures. See Francis Godwin. *The Man in the Moone* ed. William Poole (Peterborough, Ont: Broadview Press, 2009) 40-41, hereafter cited as "Godwin." As Chapman notes, John Wilkins's *The Discovery of a New World in the Moone* (1638) contains a very brief meditation on the spiritual being of the "Selenites," querying whether they were free from original sin or requiring salvation. But, Chapman concludes, "What concerned [Wilkins] were the mechanics of the journey [rather than the inhabitants of the moon], and this is what earmarks him as a scientific writer rather than a story-teller" (Chapman 30). While it is the purpose of this chapter to demonstrate a level of non-distinction between storytelling and science, Chapman's invocation of the "earmark" seems aptly provisional as a taxonomical device. For a sustained analysis of the challenge to seventeenth-century Christians posed by the plurality of worlds, see William Empson, "Donne the Space Man," *Kenyon Review* 19.3 (1957) 337-399.

²² Projectors are discussed at length in chapter three

²³ It is apparent from his decision to title another utopian work *Nuncius Inanimus* (see below note 18) and his reference to Gonsales as "The Speedy Messenger" on the title page of *The Man in the Moone* that Godwin was familiar with Galileo's *Siderius Nuncius*, but it has not been proven that he read Kepler's response to that text or the *Somnium*. Hutton, however, remarks on a number of striking similarities between the two works, many of them germane to my argument. She cites, for instance, the curious coincidence that both writers depart from Galileo and portray the light and dark spots on the moon as sea and land respectively, and that the Spanish nationality of Godwin's astronaut is in line with the preference of Kepler's daemon narrator. In their descriptions of the flight, both writers compare the astronaut to a bullet shot from a cannon, and both include a sustained description of the earth as seen from above as a series of evocative similes (see below). Given these connections, it seems at least likely that Kepler was a source for Godwin, but I do not mean to suggest that the astronomical insights of Godwin arrive *through* Kepler. Even if *The Man in the Moone* is not in direct conversation with the *Somnium*, both works share an approach to the imaginary voyage characterized by attention to physical or sensory detail in narrative passages that illustrate scientific conjectures. Hutton briefly remarks on this significance herself, offering, "the parallel between *The Man in the Moone* and Kepler's *Somnium* resides precisely in the fictive: both texts use fiction to establish fact." It is precisely how this establishing occurs that requires further meditation. See Hutton *Op. Cit.* 6-10. Hutton does not mention one glaring piece of evidence that Marjorie Hope Nicolson does (though not in the context of connecting Kepler to Godwin), that Kepler's father, exactly like Gonsales, was ill regarded by the family for his mercenary service to the Duke of Alva. See "Kepler, the Somnium, and John Donne," *Journal of the History of Ideas* 1 (1940) 261.

²⁴ John Donne, *Ignatius, His Conclave*, facsimile of the 1611 text (New York: Columbia U.P., 1941)

The description of Kepler is a translation of a passage from Kepler's 1606 *De Stella Nova* deliberately arranged to make the astronomer appear more pompous. The most recent critical analysis of this episode can be found in Dean Swinford. *Through the Daemon's Gate: Kepler's Somnium, Medieval Dream Narratives, and the Polysemy of Allegorical Motifs* (New York: Routledge, 2010) 91-93.

²⁵ The complete note: "Ominous indeed is the infliction of a deadly wound or the drinking of poison; and the spreading abroad of this writing seems to have been equally ominous for my domestic affairs. You would think a spark had fallen on dry wood; that is, that my words had been taken up by dark minds which suspect everything else

of being dark. The first copy went from Prague to Leipzig, thence was taken to Tübingen in 1611 by Baron von Volckelsdorff and his tutor in morals and studies. Would you believe in the barbershops (as if the name Fiolxhilde is particularly ominous to people there by reason of their occupation) my little tale became the subject of conversation? Certainly in the years immediately following, from that city and that house, there issued slanderous talk about me, which, taken up by foolish minds, became blazing rumor, fanned by ignorance and superstition. Unless I am mistaken, you will agree that my home might have been without that plague of six years, and I without my recent year-long trip abroad, had I obeyed the instructions I dreamed Fiolxhilde had given. It has pleased me, therefore, to avenge the trouble my dream has caused me by publishing this work, which will be another punishment for my adversaries.” The English translation comes from John Lear’s 1965 edition of the text. Kepler. *Kepler's Dream* trans John Lear (Berkeley: University of California Press, 1965) 91.

²⁶ As evidenced by his belief that Donne’s satire must have referenced the *Somnium* despite the direct quotation from his 1606 report *De Stella nova in pede Serpentarii*

²⁷ Kepler 163

²⁸ Ibid. 165

²⁹ Ibid. 57, 88

³⁰ And, as described above, a medium for defending against real or perceived attacks.

³¹ Frédérique Aït-Touati. *Fictions of the Cosmos: Science and Literature in the Seventeenth Century* (Chicago: University of Chicago Press, 2011) 43-44.

³² Kepler 62

³³ Ibid. 54

³⁴ Aït-Touati 47

³⁵ The term emerged as a label for imagined conscious experience in Thomas Nagel, “What is it Like to be a Bat?” *The Philosophical Review*, 83:4 (1974) 435-450. For critical overviews of the development of the term into a proper school of thought see Gregory McCullough, “What it is Like,” *The Philosophical Quarterly* 38:150 (1988) 1-19; and Greg Janzen, “In Defense of the What it is Likeness of Experience” *The Southern Journal of Philosophy* 48.3 (2011) 271-293. Jonathan Kramnick references Nagel’s formulation to describe transcriptions of mental states in eighteenth-century British literature in *Actions and Objects from Hobbes to Richardson*. (Stanford: Stanford University Press, 2010) 66.

³⁶ See above note 24. It is possible that both Kepler and Godwin independently make the same connection between terrestrial and extraterrestrial exploration, but the connection seems conspicuous in light of the above-mentioned similarities. Still, very few, if any, readers of Godwin could be expected to have familiarity with Kepler’s manuscript and thus associate Spaniards with hard bodies on that basis. Nonetheless, Godwin’s in-joke collaborates with the explicit reference to Salamanca and Spanish navigational prowess to transform space travel from an abstract conjecture (it is possible that a Spaniard might find a new world because Spaniards are so adept at finding new lands on Earth) into a thought experiment (what kind of physical person would travel best through space?).

³⁷ Francis Godwin, *The Man in the Moone* ed. William Poole (Peterborough: Broadview Press, 2009) 79.

³⁸ Allan Chapman, “‘A World in the Moon’: John Wilkins and his Lunar Voyage of 1640,” *Royal Astronomical Society* 32 (1990) 122.

³⁹ See Hacking 7 and Patey 14-16

⁴⁰ Another term that has been the topic of some recent critical attention is “wonder,” which in the context of seventeenth- and eighteenth-century literature appears as an important concept at the nexus of empiricism and fantasy. Wilkins, for instance, begins his address to the reader in *Mercury, or, The secret and swift messenger* by acknowledging that works’ debt to Godwin’s *Nuncius inanimatus*, a work Wilkins described as having “rather raise[d] my Wonder than Belief.” He continues to say he would have discounted Godwin’s work as “fabulous” were it not for the credit of its author, and describes the composition of his own work (on the possibility of something like telepathy) as having generated from his investigations into the implicit believability of Godwin’s text on the subject. This address, however, quickly concludes with a recourse the modesty topos without Wilkins stating explicitly that he aims to raise belief rather than wonder. This episode is one of many that attests to both the playfulness and liberality with which questions of belief were raised in matters of science and fiction alike, and more importantly, how ideas such as wonder and belief could be evoked as distinct sensations, but which were far from categorically opposed. John Wilkins. *Mercury, or, The secret and swift messenger shewing, how a man may with privacy and speed communicate his thoughts to a friend at any distance* (London: 1694), 4-5. For a critical history of wonder, with emphasis on its importance to the English novel, see Cappoferro op. cit. as well as Sarah T. Kareem, *Eighteenth-century Fiction and the Reinvention of Wonder* (Oxford: Oxford university Press, 2014).

⁴¹ Godwin 87

⁴² McKeon, *Origins* 47-48

⁴³ Gilbert’s arguments, largely in line with our current understanding of gravity, employs a language of “substances”: “So lunar things tend to the Moon, solar things to the Sun, within the orbes of their own effluvia. The emanations hold together by continuity of substance, and heavy bodies are also united with the Earth by their own gravity...” William Gilbert. *De Magnete* trans Edward Wright (New York: Dover, 1958) 340. Godwin’s debt to Gilbert is made more explicit in a passage following the one quoted above: “I found then by this Experience that which no Philosopher ever dreamed of, to wit, that those things which wee call heavie, do not sinke toward the Center of the Earth, as their naturall place, but as drawn by a secret property of the same, in like sort as the Loadstone draweth Iron, being within the compass of the beames attractive (88). On Godwin and Gilbert, see F.R. Johnson *Astronomical Thought in Renaissance England* (Baltimore, Johns Hopkins Press, 1937) 233-239.

⁴⁴ Godwin 86

⁴⁵ Godwin 93. The *OED* references uses of the term “globe” to refer to global maps by the mid sixteenth century.

⁴⁶ I use the phrase “view from nowhere” in reference to Thomas Nagel’s landmark presentation of the problem of objectivity; see Thomas Nagel, *The View From Nowhere* (New York: Oxford University Press, 1986)

⁴⁷ Schaffer and Shapin 60

⁴⁸ Alexander Wragge-Morley, “‘Vividness’ In English Natural History and Anatomy, 1650–1700” *Notes and Records of the Royal Society of the History of Science* 66.3 (2012) 342

⁴⁹ Quintilian, *The Institutio Oratoria of Quintilian* trans. Harold E. Butler (London: W. Heinemann, 1921) 397-398.

⁵⁰ Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* (Baltimore: Johns Hopkins University Press, 1984) 184

⁵¹ Georg Lukács, *Writer & Critic, and Other Essays* trans. Arthur Kahn (New York: Grosset & Dunlap, 1971) 110 - 119

⁵² Stalnaker recounts a similar story involving Denis Diderot's compulsive taking apart and rebuilding of the "bas," or stocking-making machine. See Joanna Stalnaker, *The Unfinished Enlightenment: Description in the Age of the Encyclopedia* (Ithaca: Cornell University Press, 2010) 110-120

⁵³ Godwin 81

⁵⁴ Philippe Hamon, *Du Descriptif* (Paris: Hachette supérieur, 1994) 4-5.

⁵⁵ For extended discussion of the Encyclopedie's four separate entries on description, see John Bender and Michael Marrinan, *The Culture of Diagram* (Stanford, Calif: Stanford University Press, 2010) and Stalnaker *Op. Cit.*

⁵⁶ McColley "The Date of 'Godwin's Domingo Gonsales'" *Modern Philology* 35.1 (1937). He notes, for instance, the theatrical affinity between the Jesuits' account of their interview with the emperor Wan-Li occurring via messengers and lasting more than three days, and Gonsales's encounter with the invisible emperor of the moon, Irdonozur, occurring through a window, and lasting "a quarter of a moon," or about a week in lunar time.

⁵⁷ A 1768 edition places Godwin's tale alongside an anonymous and ostensibly non-fiction "Description of the Pike of Tenerife, as traveled by some *English* merchants." That description begins immediately following the conclusion of *The Man in the Moone*, and begins, "Mention being made in the preceding story of the Pike of Teneriff..." The non-fictional appears to be intended to vivify the fictional, or to furnish the imagination in the service of readerly vision. Godwin, *The Strange Voyage and Adventures of Domingo Gonsales, to the World in the Moon: With a Description of the Pike of Teneriff, As Travelled Up by Some English Merchants* (London: 1768).

⁵⁸ For instance: "The Bear-men were to be her Experimental Philosophers, the Bird-men her Astronomers, the Fly-Worm- and Fish-men her Natural Philosophers, the Ape-men her Chymists, the Satyrs her Galenick Physicians, the Fox-men her Politicians, the Spider- and Lice-men her Mathematicians, the Jackdaw- Magpie- and Parrot-men her Orators and Logicians, the Gyants her Architects, etc." Margaret Cavendish, *Political Writings* ed. Susan James (Cambridge, England: Cambridge University Press, 2003) 18. All subsequent references to *The Blazing World* are from this critical edition.

⁵⁹ Cavendish 109

⁶⁰ Ibid. 23

⁶¹ Ibid. 28

⁶² Sprat *History of the Royal Society* (London, 1667) EEBO, 100; see also Shapin and Schaffer 327

⁶³ McKeon offers a succinct outline of Sprat's subtle handling of this issue: "On the one hand, and in accord with the traditional habit of subsuming the question of epistemological capacity under the aegis of social hierarchy, gentility may plausibly be accorded the intellectual freedom of material independence. On the other hand, as the socializing influence of custom and education becomes increasingly evident during these decades, intellectual freedom comes to be understood as a function not just of a public and material but, more subtly and profoundly, of a private and cultural independence." *The Secret History of Domesticity: Public, Private, and the Division of Knowledge*

(Baltimore: Johns Hopkins University Press, 2005) 349. To be sure the new astronomy, especially as communicated through fiction, appealed to the imaginative faculties of the private, and freethinking individual.

⁶⁴ Thomas Hobbes, *Leviathan* ed. Richard Tuck (Cambridge: Cambridge University Press, 1991) 60

⁶⁵ Translated in Shapin and Schaffer, 351

⁶⁶ Cavendish 75

⁶⁷ See Simon Schaffer “Self Evidence” *Critical Inquiry* 18.2 (1992) 327-328

⁶⁸ Schaffer’s article concerns physical and thought experiments natural philosophers have performed upon themselves

Chapter Two

The Invisible Laws of Empiricist Fiction: A Case Study in Physic

The previous chapter traced readerly contracts across scientific fictions over the course of the seventeenth century, from the elliptical promise of Kepler that knowledge emerges from prior belief in a particular arrangement of facts, to Cavendish's apology for fiction as a mode of intelligibility made possible by consent. In what follows, I examine the renegotiation of the relationship between fiction and scientific knowledge between the later seventeenth century and early eighteenth century in England, and in particular the role of fiction in translating empirical observation to probable authority. While the modern concept of probability—that is, as a measure of likeliness to occur, rather than agreeableness to authority—emerges in this time with the publication of the Port-Royal *Logic* in 1662, the chartering of the Royal Society that same year inaugurates a rhetorical program to promote probable knowledge as the best attainable form: the terrestrial reflection of divine certainty. Essential to the Royal Society's program is their positioning in printed tracts such as Sprat's *History* and the prefatory matter of Boyle's experimental publications, as arbiters of empirical fact, relentlessly engaged in the production of new and useful knowledge through efficient and unbiased compiling of empirical data both from within laboratory settings and as reported by civilians.

Daniel Defoe's education coincided with the Royal Society's empiricist program becoming mainstream in scientific thought, and his late-life fiction writing takes aesthetic direction (though by no means exclusively) from experimental case histories and reports of interesting events. I analyze in particular his 1722 hybrid historical fiction *A Journal of the Plague Year*, as, like the works discussed in the previous chapter, it mediates questions of

science through the evidential employment of fictional narrative. *A Journal*, like much of Defoe's corpus, is presented as historical fact, unedited, though editorially vetted. Where few literary critics have thought it fit to call Defoe a "liar" as Barbara Foley does, several have noted that the fictionality modern readers assume of Defoe's work was not elucidated in the case of *Robinson Crusoe* until after the fact in 1719's *The Farther Adventures of Robinson Crusoe*.¹ In the preface of that work, Defoe recuses himself from presenting absolute factuality in favor of "relative fidelity of narration." McKeon describes this admission as potentially levelling the dichotomy between "True history" and "romance" in favor of a scale between being "a greater or lesser degree history-like." However, as McKeon notes, Defoe is not willing to take this "enormous step" explicitly, and thus *Crusoe* becomes "an allusive allegorick History" in the exegetical tradition of *The Pilgrim's Progress*.² Though *A Journal* was published after this monumental preface, it does not bear Defoe's name and includes no editorial commentary. Rather, it is presented as a found document composed by a survivor of the 1665 plague, who, in the text's sole footnote, is revealed to be dead at the time of publication.³ Briefly, the work consists of the periodic observations of a fictional narrator, H.F., a London saddler who spends 1665 and early 1666 in the city conducting amateur research on the epidemic. Noted for its adherence to Royal Society protocols for data collection, *A Journal* consists largely of recorded discourse reporting incidents around the city in addition to its most striking formal feature, the inclusion within the body of the text of actual historical documents, including bills of mortality and the official orders of the city government. As the narrator eventually endorses the city's 1665 quarantine measures, supports the improvements made between the plague year and the unspecified, pre-1722 date of assumed composition, and thus implicitly endorses the Quarantine Act of 1721, critics have called attention to Defoe's uncomfortable fusion of empirical authority

and state authority. My interest is in how *A Journal*, in ways that echo across his corpus and the early English novel generally, appears to accord knowledge with empirically derived probability, while actually exposing the latter's weakness, or, in Lockean terms, its "dimness."

In *A Journal*, Defoe proves himself familiar with contemporary modes of observation and experimentation, employing fairly advanced statistical analysis on the numbers reported in the bills and skeptically reasoning probable conclusions from his observations and those he receives reports of. At issue in my analysis of Defoe as science writer is H.F.'s consistent hesitation between various understandings of the plague's ontology (which is resolved ultimately as an explicit, though skeptical, endorsement of quarantine and implicit affirmation of corpuscular infection theory) to substitute for the processes of scrutiny unavailable to medical science at the time.⁴ Simply, Defoe's narrative attempts to lend credibility to medical opinions that are necessarily undemonstrable by empirical methods. A corpuscular theory of medicine, like the Copernican hypothesis, remains so ambiguous within the epistemological framework of its adherents that evidence requires further engineering than the reporting and compiling of sensory data. The plague proves both too small and too fast for the testimony of hands and eyes, while its scale and the mysteries of its movement jeopardize the intelligibility of public data. *A Journal* reflects the Royal Society program in a way that illuminates the subtleties of empirical experiment that have been largely overlooked in modern historiographies, but which are the target of experimentalism's discontents, the strongest voice of whom is Hobbes.

Hesitation is a constant across Defoe's career as a novelist, for instance in Crusoe's slippage between seeking two distinct forms of "deliverance," one divine, one earthly. There is no need to catalogue the ways in which *A Journal* is also an "an allusive allegorick History"; rather, the interest of this study is in how Defoe's narrative technique supports the scientific and

ultimately evidential function of this text. In this valence, the question of how the plague might be better understood, which, through H.F.'s employment of the unknowability topos signifies a recourse to providence, ultimately emerges as a matter of secular public health, resolvable through the language of quasi-empirical reasoning. This resolution, in the mold of Boylean medicine, is premised on the plague's material though invisible nature, but is ultimately practical and process oriented. It is not a scientific explanation but a prescription or "receipt": mandated quarantine. Defoe presents his conclusions as the result of an experiment incorporating significant empirical data (at the level of the city even), but in a manner that accommodates conceptions of divine justice through select instances of poetic justice. H.F. points to an ontology of the plague that is susceptible to scientific knowledge, but this knowledge is partial at best in the text's 1665 setting and the action it commands (quarantine) is justified less by the wisdom of mathematical or experimental probability than by its limitations.

Because it is certain regarding questions of authority and uncertain regarding questions of science, *A Journal* practically bridges the epistemological debate between Boyle and Hobbes as it has been canonically glossed by Shapin and Schaffer. But their account bears revisiting precisely because it brackets off many aspects of Boyle's practice that do not fit the criteria of the modern science he supposedly pioneers. Boylean experimentalism is premised both on the dominance of sensory evidence and its insufficiency. While ideal experimental facts are those that present themselves directly to the organs of sense, experimental knowledge is probabilistic and is often generated through the analysis of trials in which the phenomenon in question—a vacuum, or a disease corpuscle, for instance—is never sensible as such. Experimentalism thus contains within it the potential to either obviate or generate universal prescriptions. Ultimately, the (narrowly defined) positions of Boylean experimentalism and Hobbesian universalism are

synthesized in *A Journal*, or perhaps, Defoe's Hobbesian employment of observational and statistical data propounds a reevaluation of his empiricism, which has been largely characterized by his interest in the sensory or experiential acquisition of ideas, but almost as often follows an opposing trajectory, towards obscurity and ignorance. In the case of the plague, this ignorance is a condition of the distemper's corpuscular invisibility. Furthermore, to the degree that the plague can be made visible (or otherwise apparent to the organs of sense) at the individual level by tokens on the body, or at the demographic level by mortal statistics, Defoe's narration discourages the individual apprehension of causal relations. This opacity, I argue, is not a departure from the experimental rhetoric of Boyle and the Royal Society, but a form of demonstration characteristic of the corpuscular hypothesis.

Medical mystery, and the plague in particular, are central to the historiography of probability. The most overarching reason for this is because medicine remains for so long a "low" science, never undergoing a paradigm shift equivalent to the mathematically based sciences. "Physic," as the authors in this chapter referred to it, is, at the time of the London plague, and indeed into Defoe's adulthood, a practice left behind, which, as Locke claims of natural philosophy, appears "not capable of being made a science."⁵ The techniques of seventeenth-century physicians are not qualitatively different from those of the second century; their only available epistemology is probable inference made from physical signs—induction. This is, according to historians of probability, the status of almost all natural sciences through the Renaissance. Hacking's *The Emergence of Probability* and Foucault's *The Order of Things*, the most influential works on this history prior to Patey's *Probability and Literary Form*, both identify "around 1660," as a point of epochal shift. Neither account argues that the publication of the Port-Royal *Logic* brought about a new consciousness of probability, or even greatly advanced

the general understanding of probability-as-likelihood (for there is no significant mathematical breakthrough, only a refining of methods). Rather they argue that underlying disciplinary and cultural evolutions allowed for the thriving of hitherto suppressed discourses. For Foucault, 1660 and after is an epoch defined by the “episteme” of certainty, and thus probability, characterized by divination from resemblances, is relegated to the low, while the newly legitimized sciences are capable of establishing facts of identity and difference. Hacking’s more conservative account is that inference from signs remains a dominant practice, but that the late seventeenth century inaugurates an understanding of signs as relatively transparent indications from nature, rather than the objects of more or less authoritative opinions (the hierarchical scale of which constitutes earlier notions of probability). In the conclusion of this chapter I examine how the theorization of probability in Locke’s *Essay Concerning Human Understanding* both articulates the fine line between probability and certainty that is epoch defining for Foucault while pushing probability forward as a dominant end of cognition. *A Journal* is perhaps the work of Defoe’s that is most engaged with Locke’s *Essay*, and as such reflects—and is conscious of itself as a commentary on—the epistemic conflicts of its 1660s setting. The plague, which suspends all certainties, provides Defoe an ideal opportunity to synthesize approaches to the probable: rhetorical and mathematical, ancient and modern, internal and external, poetic and scientific.

Corpuscular Ellipsis

As Shapin and Schaffer’s landmark study has become canonical in early modern studies, it is not necessary to rehearse the full contours of the conflict between Hobbes, Boyle, and the Royal Society in the early Restoration. Some of this debate has been covered in the previous chapter. Briefly, Hobbes took issue (petitioning publicly and writing a satirical Latin dialogue)

with Boyle's demonstration of a newly invented air-pump for members of the Royal Society gathered at Gresham College. Boyle presented his device (accurately) as producing a vacuum, a fact observable from various instrumental measurements but most strikingly from the suffocation of a bird placed inside the vacuum chamber. Hobbes's critique of Boyle is leveled across two interwoven dimensions, one local or procedural, the other metaphysical. On the first level, he disputes the efficacy of the machine, targeting specifically the airtightness of the valves, and thus affirms the supposed vacuum chamber to be full of air, and the bird to have died from the movement and pressure of the air, not its absence. This is merely an explanation of why Boyle's specific set of produced vacuums were not so, Hobbes's overarching argument being that vacuums are antithetical to a properly materialist understanding of the universe. His epistemological argument further breaks down into two interlocking points: that reason aided by mathematics is the most perfect and thereby only trustworthy authority in metaphysics, and consequently that the testimony of the senses that the Royal Society espoused posed a danger to England's collective body. Leaving aside even this political argument, which is of course a significant motivation for Hobbes's quarrel with Boyle's claims to revolutionary knowledge, the Hobbes/Boyle debate reveals the precariousness of empirical knowledge at the crucial moment of its mainstream valuation. Though Hobbes would ultimately be proven wrong about the impossibility of vacuums, his skepticism of the Royal Society remains an important historical reminder of how much interpretation, representation, and personal credibility subsumed supposed knowledge from sense data. Later in this chapter I will explore how Hobbes's countermodel, a rational universalism rooted in language, is equally influential on *A Journal*. For now, however, the connection between Boyle's materialism and his presentation of sense data warrants investigation.

As the early fellows of the Royal Society recognized in choosing it as an emblem, and as Shapin and Schaffer recognize in putting it at the center of their study, the air-pump promises a perfect visualization of scientific knowledge and the reliability of technological mediation in its production, both promises fulfilled by its glass exoskeleton.⁶ Though interested in the precarity of this epistemological gesture, Shapin and Schaffer nonetheless ascribe to Boyle what Helen Thompson calls “a ‘realist’ regime of transparently apprehended and transparently rendered facts.”⁷ It is now common knowledge that not all of Boyle’s experimental interests are scientific by current standards, but more pertinently, even those experiments, such as the air-pump trials, that present the straightest possible path between sense data and scientific conclusions complicate standard assessments of the empirical turn in science, for instance Watt’s claim that “from the mediaeval belief in the reality of universals, ‘realism’ had come to denote a belief in the individual apprehension of reality through the senses.”⁸ To the degree that this claim is an accurate assessment of the Hobbes-Boyle debate, there is much to unpack about how the scientific method navigates between sense and apprehension for Boyle, and, later, for his pupil Locke, who is the more direct referent of Watt’s analysis. In both empirical experimental practice and so-called empirical fiction, this final state of apprehension may turn on the unreliability of sense or a probabilistic inference generated to fill a gap in sense.

The two defining aspects of Boyle’s natural philosophy, his location of evidence in sensory experience and his advancement of a corpuscular theory of matter, are anything but simple to square with one another. In the face of this difficulty, Shapin and Schaffer portray Boyle as exclusively interested in facts at the expense of real inquiry into the material properties on trial. “Since the world of corpuscles is inaccessible to our senses,” they argue, “causal inquiry was to be tactically segregated from the main task of the natural philosopher.”⁹ As we shall see,

Boyle is prone to stressing experimental results as facts sufficient to justify general positions, but this does not necessarily mean it was not also his main task to investigate corpuscular causes, only that the genre of fact he could produce did not isolate corpuscular action. Later in this chapter, I embrace Shapin and Schaffer's central claim that the culture of experiment Boyle institutes within the Royal Society relies on a sense of sensory self-evidence to obscure the process of translating experimental data to stable knowledge, but such evidence was not always available, and certainly was not a necessary condition for Boyle's advancing of claims about the natural world. For Shapin and Schaffer, and later for Latour, the central axis of rhetorical emphasis for Boyle and his adherents is that experimental knowledge is "discovered rather than invented."¹⁰ In the case of the air-pump, this imperative necessitates a defense of the instrument's integrity, and a defense of instruments in general as inert revealers of natural principles rather than corrupting forces that introduce further contingencies, hence the recreation of the vacuum across many iterations of pump, with various signals of the vacuum's presence: both qualitative evidence like suffocating birds and quantitative evidence in the form of hydraulic measurements. That air "hath a spring," and that it is capable of being pressurized or evacuated is, for Boyle, evidence of an insensible quality. To demonstrate that air is a collection of minute material bodies, Boyle cites processes like sublimation, distillation, and other instances when things become and unbecome air, as well as displacements of other substances or the reactions of animals, but never is the thing itself supposed to be visible.¹¹

Defoe's treatment of the plague attempts to navigate this impasse between the most widely accepted guarantors of knowledge (witnessing and quantitative data) and the real scope of the corpuscular hypothesis. Boyle, while aware of the potential of this hypothesis to revolutionize the understanding and management of disease, recognized his relative ignorance of

the field as too toxic for the reputation of the newly chartered Royal Society to touch. In a June 1665 letter to Henry Oldenburg, the society's foreign secretary, Boyle references a promising treatise by an Italian physician, offering it to distribute it as a guide for experiments, "though Physick be not the most proper and immediate Scope of our Society." In this instance as in other matters medical, Boyle recuses himself to the role of distributor "that it may have the more authority." Defoe, whose education included Boylean corpuscular theory, also developed the latter's predilection for the form of the collection. Boyle's most thorough published work on medicine is the 1688 volume *Medicinal Experiments*, which, like Defoe's *The Storm* (1703), is a collection of solicited entries, compiled with utility in mind. If read as a non-fiction analog for Defoe's project in *A Journal*, *Medicinal Experiments* is a valuable template for the establishment of medical knowledge in Defoe's time. Consisting of some relatively short prefatory materials and a collection of "receipts" (what we would today call prescriptions), *Medicinal Experiments* is a hybrid of the Royal Society's program of experimentally reproducible result and the timeless art of folk remedy. Boyle, being "no specialist in Physick", offers no explanatory framework for the efficacy of the remedies provided, nor any form of evidence beyond the assurance of the unnamed contributors. Nonetheless Boyle bolsters the legitimacy of his remedies against those who would offer such explanations, remarking, "Tis usual for authors to offer prescriptions based on their conjectures rather than their tryals," and thus stresses the "Great deal of difference betwixt being told by an author that drug or receipt works, and to have particular notice given of it, and not only confirmed it is good, but to be told how good it is, and possibly also that it may be usefully employ'd in other distempers besides those for which 'tis prescrib'd in the Printed Book."¹² The difference between Boyle's collection and that of a lesser author appears less qualitative than quantitative; its value is in its attention to the "particular" and in the efficiency of

its presentation. Such engagement with ostensibly lesser competition constitutes not merely a sales pitch, but rather the most earnest claim for the experimental method in medicine possible at the time, though its ostensible experiments have taken place outside the frame of the text.

Boyle outlines the potential application of the corpuscular hypothesis for the field of physic in his manifesto *Considerations touching the Usefulness of Experimental Natural Philosophy* (1664). In that work, Boyle advances the hypothesis that diseases are commonly the result of imperceptible agents: “the propagation of Infectious Diseases, which being conveyed by insensible Effluvia, from a sick into a healthy Body, are able to disorder the whole Œconomy of it. . . . Corpuscles, though so small as to be below the sense . . . performe great matters upon humane Bodies.”¹³ This sensible—though unverifiable within the confines of contemporary technology—claim forms the basis of Boyle’s medical philosophy without directly informing his published ideas on the practice of medicine. This articulation was, however, still broad enough to render all things possible, especially in remarkable instances such as the plague. As such, Royal Society Fellow John Beale was able to write to Boyle in 1665, in all seriousness, of his investigation into the case of a woman “who could sense if the plague was within 30 miles from her through pain in her sores.”¹⁴ Beale is not opening a new avenue of research, but extending an anecdotal truth already accepted by Boyle, who affirms “the Pains and Aches that are often complain'd of by those that have had great Wounds or Bruises... presage great Mutations in the Air.” This argument appears in *New Experiments Physico-Mechanicall, Touching the Spring of the Air* (1660) as an illustration of the air’s “ebbing and flowing” by virtue of its corpuscular nature. The same work that is canonically credited with inaugurating the regime of transparent visual evidence in the form of the air-pump is full of such diffuse and conjectural applications of

sensory evidence. Where physic remained largely opaque to research at the material level, it offered its own interpretive forms of experimental knowledge.

In *Medicinal Experiments*, Boyle the natural philosopher and proponent of materialist medicine lends credit, from beyond the grave, to Boyle the vendor of remedies, though their paths never strictly cross. Medicine, much like mechanical engineering (as discussed in the previous chapter), was the subject of much optimism in the wake of significant advances in chemistry and physics, but underwent nothing like the paradigm shifts in those disciplines over the course of the seventeenth century. Boyle's collection attests to the persistent problem addressed by Defoe's *Journal*, that the field of physic in the late seventeenth century had little internal capacity to establish credibility, so that the highest practitioners could not be effectively distinguished from the quacks. And, unlike astronomical findings, empirical observations of medical phenomena (e.g. strange cases or effective remedies) could rarely be translated into systematic knowledge. As such, *Medicinal Experiments* is enlightening as a document of early modern empiricism consciously approaching its own limitations.

The volume, by our current standards, does not distinguish a medical condition from a symptom, so that the remedies concern problems like "pissing blood" or "slagging breasts." Some entries even have the treatment subsume the ailment—for instance, "The Lady Fitzharding's Eye-Water, which lately cur'd an almost blind Person, whose Eyes look'd like Glass."¹⁵ It is only that and not how these remedies work of which the reader is assured. And it is the good standing of the contributors according to the names of Boyle and the Royal Society that are meant to suffice to this end. This, as above noted, is an unremarkable form of promise, though, unlike the vast majority of Boyle's works bearing the title of "experiments," *Medicinal Experiments* does not describe or diagram any experiment devised or carried out by Boyle

personally. The work was republished frequently throughout the 1690s, adding, and more intriguingly, subtracting prefatory materials. The 1692 edition (published closely after Boyle's death) is actually more explicit than several later editions in explaining the methodology by which the receipts came to be published. As outlined in the publisher's preface, receipts were sent to "a learned physician beyond the sea," who distributed them in order that a coterie of physicians might compare them through their own regimented patient trials. These credentialed but anonymous figures implored "the Noble Author" (i.e. Boyle) to make them "more Publick," and he in turn added some of his own.¹⁶ This methodological note is followed by a brief author's preface from Boyle giving his stamp of approval. A 1693 version, which I reference from here forward, elides almost all of the methodological explanation but contains an extended author's preface, presumably in order to revive the work's personal connection to the deceased Boyle. Subsequent editions in 1694, 1696, 1698 and then throughout the eighteenth century vary in their inclusion of the original publisher's preface (authorized by an *ipse dixit*) or the extended author's preface.

In all these editions, however, the experimental data is presented as having been reported remotely by unnamed practitioners upon mostly unnamed bodies. Boyle stresses this aspect of the text's generation as an improvement over the proprietary approach taken by more famous physicians, whose private books of receipts are characterized as doubly unjust to patients: requiring them to pay inflated prices for, ostensibly, less researched treatments across the totality of possible ailments. Efficient and accountable, the centralized collection model of medical publication is held up as an ideal one by Boyle, who stresses its prior success among the Paris Assembly of Physicians, who cooperatively investigate "Not only new discoveries, odd cases, speculations and observations, but ... receipts and processes of remedies."¹⁷ This arrangement is

of course only hypothetical in England, thus the receipts of remedies Boyle provides are suggestive of an absent centralized research apparatus. Boyle is not simply being generous with his knowledge, but using both the tool and rhetorical force of publication to establish the value of such knowledge by its ubiquity rather than its secrecy.¹⁸ The empirical fact that would be constituted by the receipts' efficacy in any given case is set-up to legitimize the Royal Society's burgeoning command of the invisible world. Why then, would Boyle's executors deem, if only temporarily, that Boyle's word either obviated the need for or surpassed any explanation of methodology? One possibility is that the centralized authority of the "noble author" could induce more credibility than a diffuse array of contracted witnesses. Another is that, given that the work, in all of its forms, takes the receipts as *faits accomplis* (at the exclusion of what today would constitute the majority of a research publication), it is logical to elide even the discussion of past trials in favor of an atemporal insistence on efficacy.

The commitment to the criterion of efficacy to establish medical credibility, however, draws Boyle into confrontation with what he imagines to be a significant piece of empirical data: his own history of infirmity. He writes, "many may think it strange as I myself have been prone to do that I should presume to recommend medicines to others who for divers years have been so infirm and sickly myself and some tis like will upbraid me with *medice cura teipsum*."²⁰ The proverb from Luke seems here to be deployed against its common interpretation, in association with the discourse on judgmentalism within the Sermon on the Mount, as an injunction against critiquing others (in Boyle's case, other physicians and printed works) for faults in oneself. Rather, in this context, Boyle's reference aligns the proverb with the taunts of Christ on the cross reported by Matthew, "He saved others; himself he cannot save." As an advocate of an empiricist approach to medicine, and not wishing to embrace any providential justifications for

his infirmity, Boyle takes this potential criticism seriously and very much at face value. Significant space in the preface is devoted to an explanation of his personal history, intended to demonstrate the exceptional status of his case relative to the normative conditions his volume seeks to address. In short, he attributes his chronic condition to two sources outside of himself and his milieu: his mother, who birthed him at forty-two, and Ireland, where he fell from a horse and, owing to the poor conditions of roads and inns there, was never able to fully recover. He continues to implicate the books of “Hebrew and other eastern characters” he read while trying to recover in London with aggravating his condition. The preface concludes: “This short narrative, I hope suffice to shew that my personal maladies and sickness cannot rightly infer the inefficacy of the medicines I impart or recommend, and if it shew that it will do all that was aimed by this representation.”²¹

If Boyle is referenced at all in discussions of *A Journal of the Plague Year*, it is as a source for Defoe’s treatment of the corpuscular hypothesis.²² What I wish to call attention to in the case of *Medicinal Experiments* is how, as in the case of seventeenth-century astronomy, judgement made upon narrative is invoked as an essential component of medical understanding. The pathology of an illness, however corpuscular, however potentially ascribable to physical and chemical laws, requires narrative evidence, or, requires narrative to establish the value of other forms of evidence. Narrative is again invoked to perform a mediating function between fact (age, geographic location, duration and type of ailment) and knowledge (the efficacy of the medicines Boyle imparts or recommends). And here, the ontological hesitation invoked in the Royal Society’s demonological investigations (as discussed in the previous chapter) is shifted. Where there the surprisingness of the empirical fact was invoked to the credit of its eye-witness sources, here the credibility of the source is affirmed by its own surprisingness. That is, Boyle’s

willingness to out himself as a flawed witness to the efficacy of medicines makes him all the more credible for his modesty.

Without suggesting that *Medicinal Experiments* significantly influenced Defoe, I want to draw attention to the way in which his fictional project in *A Journal* replays the dilemma of Boyle's author's preface. Like *Medicinal Experiments*, *A Journal* operates according to the premise that public health can be negotiated only through personal narratives (individual and collective), even, and especially, when the two do not correspond. In short, Robert Boyle seeks credibility as a compiler of medical remedies though he himself is not medically sound (and at the time of publication is deceased), while Defoe's text is implicitly a guideline for public health procedures in case of future pandemics, though it is a first-person account of an improbable survivor, who, as the frontispiece advertises "continued all the while in *London*" and condemns his own decisions. Boyle, as widely noted, in addition to being feeble of body, possessed remarkably poor sight. *A Journal* is certainly Boylean to the degree that it credits forms of sense data other than sight, which is for Locke necessarily dominant, but, as we shall see, it is also Boylean to the degree that it avoids relying on the transparency of the facts it presents.

While neither Boyle nor Defoe would ever make the association explicitly, the corpuscular action of the plague accords with, or at least is accommodated by, H.F.'s understanding of the plague's appearance and disappearance as the work of the "secret invisible hand" of God, and thus the corpuscular hypothesis is built on the evidence of things unseen. In *A Journal* then, the question of how to survive a plague is alternately answerable and blasphemous to answer, and the mystery of the plague's operation is either a legitimate and essential question to be addressed by experimental physicians or the very point of the thing. This hesitation translates into an ambiguity in the concept of experimental probability, so that the

proliferation of data, which generates facts in the form of outcomes rather than detailed pictures of nature, justifies useful but unfalsifiable conclusions. The gap between probable knowledge and certainty leaves space open for “improbable” cases like the sickly Boyle and the survivor H.F., but like Boyle’s springy air, the shape of a probable conjecture expands and contracts to fit the frame of its presentation. For Defoe, as for Boyle, empirical probability means accordance of events with distribution patterns of outcomes, and thus there is some argument from numerical data in *A Journal*. But for a work loaded with such data, it is intriguing to what degree *A Journal* eschews this argument and instead generates the sort of insight that cannot arise from the simple reporting of instances. Defoe might have brought together the invisible hand of God and the visible patterns of empirical data, but instead embraces the forms of probability proper to both in counterbalancing fashion.

Visualizing Hazard

The formal tension underpinning *A Journal*’s didactic, or quasi-didactic operation, is the incommensurability of its premise—the recorded experiences of one common Londoner in the year of a plague outbreak—with its assumed public utility. The problem can be described as a set of imbricated logical objections: the life of one man, even if everything he personally witnesses is appended to it, does not constitute a large enough sample to draw conclusions about a plague; the fact that he survives the plague despite leaving the relative safety of isolation to conduct interviews and make observations ought to discredit his endorsement of quarantine; all of his endorsements are premised on counterfactual suppositions that are impossible to verify within the empirical framework of the text, which is to say, only what happened happened and an individual narrative, however factual, cannot prove any suppositions about an alternate set of

realities. This final problem has been described recently by Jesse Molesworth as an inherent contradiction between portraying the concept of risk and writing a unified narrative.

Molesworth's solution is to offer a distinction between the natural philosophical underpinnings of Defoe's novels and their narrative mechanics. These novels, he claims, only "promote a partnership between statistical probability and narrative probability" without strictly according them.²³ In other words, Defoe evokes the idea of odds in order to give sense that his narrative worlds obey them, and exist within a theoretical set of other possible worlds, but this assumed relationship does not hold. Rather, H.F., *Crusoe*, *Moll Flanders*, and *Roxana* (who is explicitly a "fortunate mistress") live within the laws of probability in an exceptional manner. In this reading, *A Journal*, like *Robinson Crusoe*, is a narrative of risk thrillingly encountered and triumphed over, where H.F.'s inadvisable behavior accords with a contemporary enthusiasm for literal and figural gambling.

By focusing on Defoe's participation in scientific and mathematical culture of his time, this reading revises the formal tension identified in the classic reading of G.A. Starr, that Defoe's characters practice casuistry to sympathetically distinguish themselves from the morally questionable decisions they make. Along with J. Paul Hunter, Starr traces the origins of Defoe's fiction to publications like the *Athenian Mercury* that trafficked in the presentation of "strange and surprising" cases.²⁴ In Starr's reading, H.F.'s honor as both a historian and as a moral agent is in question (not because he makes false claims to historicity, but because his narratives do not depict probabilistic virtue rewarded), where in Molesworth's, Defoe's honor as a verisimilar fiction writer and amateur experimentalist is in question. Of course these two approaches are complementary, insofar as they both seriously scrutinize H.F.'s survival (or more properly, his survival of the plague in order to die as a credibly objective source) as a facet inconsistent with

the text's broader outlook. That outlook, in the plainest sense, is that certain behaviors increase one's probability of contracting plague and those who do so bear moral judgment for their compromising of public health, and consequently that there are or at least ought to be normative codes of conduct. By promoting probability while depicting improbable events, Defoe offers a vision of providence that both obeys recognizable patterns and enacts a form of justice.

While Defoe claimed in *The Consolidator*, "Physicians are generally Atheists, and Atheists are generally Fools," as Louis Landa notes, the majority of treatises on the plague "[paid] respects to the theological view" before exploring natural causes, so that few sources took the "extreme" position of asserting the plague, or any specific calamities it caused, as the "direct, and immediate interposition of the deity, an intervention or suspension of the laws of nature."²⁵ Nathaniel Hodges, whose plague treatise *Loimologia* (1672, English translation 1721) was a crucial source for Defoe, laments that providence was largely invoked "to aggravate the common Destruction" when wielded as a condemnation of certain physicians.²⁶ Boyle himself speaks of the plague as an event "herewith God is now pleased to afflict and Punish us," but by that reasoning understands it to be susceptible to counteraction by vegetable, animal, and mineral substances. Defoe's H.F. gives great deference to providential intervention and invokes it often as a resolution to aporia, but is careful to avoid "preaching a sermon rather than writing a History."²⁷ As in the oft-referenced episode of Robinson Crusoe's barley (which is analyzed at length the following chapter), Defoe is prone to overwriting the logic of events, alternately explaining them as providential and natural occurrences before neatly synthesizing the two.

Where H.F. employs casuistry, and in doing so invokes himself as a moral agent answering to divine injunction, it is, as Molesworth suggests, generative or preservative of the plot, which requires H.F.'s presence in London and his survival. That is, he justifies why he

should stay (which he should not have) and, implicitly, why he must have lived (which he statistically should not have). One paradigmatic instance of casuistry and another quasi-casuist act of narrative moralizing, I believe, suffice to illustrate Defoe's self-conscious elision of reasoning and narrative necessity. The first is H.F.'s decision, seemingly against his better judgment, in addition to that of his brother, to remain in London as death tolls begin to rise steeply within the city. The decision comes as the collective resolution of an act of bibliomancy²⁸ (a low-credence folk-epistemology), the premature departure of his would-be footman, the death of his would-be caretaker (chance events) and above all the triumph of predisposition. The overdetermination of this situation calls to mind Boyle's byzantine defensiveness, offering a multiplicity of causes to justify an aberrance in logic. Like Boyle, H.F. assumes the voice of a credible authority while aware that his biography discredits him according to the only criteria he has to offer. What is striking here is the text's engagement with its own precarious foundations. H.F.'s brother initially persuades him to flee for Bedfordshire with a version of Pascal's wager, claiming that it would be hypocritical for H.F. to trust God with his life but not his warehouse. Only then do the difficulty of procuring a horse and the disappearance of the footman drive H.F. to consult his bible and make the case for his casuistry: "I mention this story also as the best method I can advise any person to take in such a case... namely, that he should keep his eye upon the particular providences which occur at that time, and look upon them complexly...then, I think, he may safely take them for intimations from Heaven of what is his unquestioned duty to do in such a case."²⁹ This practical advice to the reader is undone, first by his admission, after failing to capture a sufficiently readable system of signs operating within or around the plague itself to justify his faith in such divination, that "the best physic against the plague is to run away

from it”³⁰ (belatedly accepting his brother's wisdom), and later by his tempered endorsement of a quarantine program.

The second instance is one of the text's most affecting passages, H.F.'s visit to the burial pits. In the most egregious breach of his own observational wisdom in the name of that observation, H.F. impulsively follows the death carts to Houndsditch, the site of a mass open-air grave. There he encounters three men, who, from their table at the window of the Pie Tavern—open and within sight of the burial pit—laugh at the passing of death carts, asking a sick man what he is doing out of his grave and asking H.F. why he himself has not died, to which H.F. responds “I believed I was preserved in particular, among other ends of His goodness, that I might reprove them for their audacious boldness in behaving in such a manner.” Unsurprisingly, H.F. reveals their fate: “I say, they continued this dreadful course three or four days—I think it was no more—when one of them, particularly he who asked the poor gentleman what he did out of his grave, was struck from Heaven with the plague, and died in a most deplorable manner; and, in a word, they were every one of them carried into the great pit which I have mentioned above.”³¹ As in *Robinson Crusoe*, the formal strategy of retrospective narration here allows for poetic justice to replicate providence at the level of content. Their deaths, like H.F.'s decision to stay, are again characteristically overdetermined to give preference to the appearance of divine judgment without having to affirm it as so. The cause of death more consistent with H.F.'s observations is that these men spent so much time in the vicinity of the pits—and thus it is seemingly only H.F.'s formal “enchantedness” (to use Molesworth's term, analyzed in the following chapter) as narrator that preserves him from the same fate. Indeed, H.F. comments on his own running afoul of the laws of probability: “I could not but consider with thankfulness the risk I had run.”³² H.F.'s gratitude both justifies the event's possibility and preserves him as a

moral agent. By behaving in a comparatively moral way, which precisely involves doubting his own survival, the improbability of this survival may accord with his morality, even as he endangers the public good by walking about.

It is, however, not only probability but the journal's explicit premise that H.F. contradicts here. H.F.'s claims, are, from the beginning, designed to be regarded as negotiating an internal skepticism, especially regarding the place he affords to specific details of events he has not personally witnessed. *A Journal* makes an early apology for its probabilistic rather than entirely experiential reporting as a matter of necessity, as H.F. concludes one anecdote, "I could give a great many such stories as these, diverting enough, which in the long course of that dismal year I met with—that is, heard of—and which are very certain to be true, or very near the truth; that is to say, true in the general: for no man could at such a time learn all the particulars."³³ The apology is of course "general" in itself and does not preclude H.F. offering any particulars where relevant, yet the assurance of "particularly he who asked the poor gentleman what he did out of his grave" deserves to be highlighted, especially as it comes against a hesitation about an exact date (which of the three men died is a fact while which of four days is not, both pieces of information presumably being "heard" rather than "met with" directly). That is, H.F.'s refusal from direct empiricism is not only a reluctant act of modesty, but an opportunity to cherry-pick data and engage with multiple accounts of causality.

Casuistry in *A Journal* isolates particular cases from general observations and thus enables assessments of actions outside the framework of probability-as-likelihood. Molesworth's reading—that H.F.'s weak defense of himself on probabilistic grounds is merely a plot device—provides an alluring alternative to taking Defoe seriously as a casuist, especially when H.F. does not seem to take himself seriously as one. But I believe there is more to the questions of why

H.F. stays and why he lives than simply overcoming the narrative problem of portraying risk. At face value, Defoe is offering the kind of empiricism superseded by “learned ignorance” of the divine that abounds in Royal Society rhetoric, from Sprat’s *History of the Royal Society* to Boyle’s own *Christian Virtuoso*. As Riccardo Capoferro explains, “the plague can be reduced to two different ontological frameworks, which entails a form of ontological hesitation,” and thus propounds the question “why is it so important to study it as a contingent, historical phenomenon if its essence can be better understood in terms of biblical typology?” Capoferro leaves this as an open question for Defoe, to be resolved by the later establishment of discursive boundaries between “religious and empirical languages.”³⁴ The Pie tavern incident is curious in this respect in that it seems to put medical conclusions at odds with ethical and spiritual prescriptions (H.F. should have contracted the plague from his proximity to the pit but providence spared him and punished the sinful), but, over the course of the text’s entirety, these moments of ontological hesitation end up crediting the “true in the general” status of H.F.’s gathered wisdom, and allow the eventual endorsement of government protocols to represent both a conclusion made on observational grounds and an expression of conscientiousness towards the plague’s supernatural nature: a civic gesture of piety.

Remaining in the middle state between a fully naturalized physic and a fully supernatural account of visitation, the modern viewpoint Defoe endorses constitutes a subtle revision of the seventeenth century’s dominant paradigm, whereby, as Keith Thomas explains, “It was lawful to take physic but unlawful to trust in it too much.”³⁵ Physic, for H.F, does not replace or supersede divine causalities, but is only effective when it is trusted. Thus H.F. devotes much effort to lamenting how the plague’s unreadable action upon bodies makes it susceptible to naïve and superstitious interpretation, i.e. baseless prophesying and quack medicine. While H.F.’s

condemnations of false claims to superior knowledge, secular and divine, are decisive, he is incapable of affirming much in their place. What we might recognize as epidemiological insights in the modern medical sense are few but illustrative where they appear. Vinegar, for instance, is mentioned several times in the text as a potential defense against transmission and infection. H.F. never outright confirms its effectiveness observationally, but treats its absence as suboptimal, correlating it with the highest-risk populations and scenarios. Londoners employ vinegar variously as a disinfectant³⁶, suggesting what we would call a germ-theory of the plague, and as a tactile and olfactory cloaking substance, corresponding to an effluvial theory of plague.³⁷ The descriptions of these employments, as they are accompanied by no judgment by H.F. one way or another, are less interesting for their own sake than for the way in which H.F. instantly pivots from referencing the discrete use of vinegar to analyzing demographic patterns. A passage on the various uses of vinegar in the market concludes with “but the poor could not even do these things, and they went at all hazards.”³⁸ A passage describing a woman’s detailed regimen of vinegar application is instantly followed by a broader observation: “she snuffed vinegar up her nose and sprinkled vinegar upon her head-clothes, and held a handkerchief wetted with vinegar to her mouth. It must be confessed that though the plague was chiefly among the poor, yet were the poor the most venturous and fearless of it.” Where vinegar appears, it is not as a material counteractant to the plague so much as an indicator of probability, correlated with the poor. Vinegar thus becomes a kind of metonym for the very possibility of preventative measures, which are available only to those who are not driven by the economic necessity to face maximal “hazard.” There is something to the plague that certain people are susceptible to for material reasons that bear out statistically. In these instances, Defoe substitutes a set of unknowns (does vinegar kill plague? Does its odor, or texture repel plague?) for a correlating, though tangential,

probabilistic consideration (the poor were most at risk). Importantly, vinegar is not directly insisted upon as a cure or prophylactic, but a suggestion of the invisible and unknowable plague's susceptibility to material action in a probabilistic rather than universal manner. Because it cannot be known how it works, vinegar, as a receipt, is amenable both to the sanctity of supernatural mystery and the legitimacy of physical intervention.

This material counteraction may be favorably compared to spurious preparations such as amulets, zodiac signs, and, most upsettingly to H.F., papers with the word "abracadabra" written in the form of a pyramid:

I might spend a great deal of time in my exclamations against the follies, and indeed the wickedness, of those things, in a time of such danger, in a matter of such consequences as this, of a national infection. But my memorandums of these things relate rather to take notice only of the fact, and mention only that it was so. How the poor people found the insufficiency of those things, and how many of them were afterwards carried away in the dead-carts and thrown into the common graves of every parish with these hellish charms and trumpery hanging about their necks, remains to be spoken of as we go along.³⁹

As when Boyle offers "particular notice" of an effective remedy, Defoe holds up a selected matter of fact, "that it was so," and recuses himself from commenting on the criteria that differentiate foolish and credible measures. H.F. is careful to stress that those foolish enough to trust such things are foolish for believing the plague to be the intervention not of God but of some evil spirit. The treatment of "[natural] philosophers" is also disparaging, but grants a crucial degree of accommodation, as H.F. claims in the text's final pages:

The disease was enervated and its malignity spent; and let it proceed from whencesoever it will, let the philosophers search for reasons in nature to account for it by, and labour as much as they will to lessen the debt they owe to their Maker, those physicians who had the least share of religion in them were obliged to acknowledge that it was all supernatural, that it was extraordinary, and that no account could be given of it.⁴⁰

Yet H.F. does, in a refracted manner, give an account of the plague's eventual remission as a matter of public health in his gradual conversion to the logic of quarantine.⁴¹ Several pages

before the above account, H.F. muses, “Had the shutting up of houses been omitted and the sick hurried out of their dwellings to pest-houses, as some proposed, it seems, at that time as well as since, it would certainly have been much worse than it was,” and furthermore that “those who locked themselves up” fared better, as the “infection did not break into such houses so furiously as it did into others before; and thousands of families were preserved (speaking with due reserve to the direction of Divine Providence) by that means.”⁴²

Axiomatic to this observational opinion is that the plague operates through pathogens and is in turn operable by physicians and governments. Still, if providential and scientific conclusions were to be put at odds, H.F.’s lot would undoubtedly be with the former, for, in endorsing the receipt of quarantine, he does not admit that quarantine worked as designed. That is, rather than eventually staunching the spread of new cases while leaving those infected to a more or less certain death, H.F. describes a moment in which all those already experiencing symptoms suddenly recovered as though “the poison was taken out of the sting.” From a modern medical perspective, we would either have to say that H.F. is mistaken about the plague’s abatement (that his observations were inaccurate), or if he is telling the truth, that he contradicts himself in crediting the saving of lives to certain actions when the epidemic is so evidently unactionable.

The resolution of this contradiction is not consistent with modern medicine but is consistent with the methodology of seventeenth-century empiricism in its emphasis on outcome rather than material cause in either the Aristotelian or Boylean sense. We might say that in H.F.’s reasoning, respecting the plague’s potency, as an individual and as a community, is itself a kind of cause, and a path to divine benevolence, but one that opens itself up to the regulatory force of public science. H.F. proves himself the ideal reading subject projected by Boyle’s medical

writings. He claims no knowledge of the ontology of the plague, and weighs the wisdom of particular cases before ultimately deferring to the voice of local authority on the specific grounds that the state of ignorance the plague's invisibility entails renders the city better off unilaterally regulated than not. This we might call deference to the regime of better knowledge, which is to say, the authority that is invoked in situations when knowledge is approximate if not impossible, when the probabilistic advantages of knowing better require formal legitimation. This is the form of authority invoked in *Medicinal Experiments*, there described as the difference between the "conjectures" of independent physicians and the "tryals," though unreported, that support Royal Society publications. This species of authority is built according to the programmatic assurance that it is underwritten by experimental evidence, but, as I intend to show, *A Journal* mingles this empirical authority with a more absolutist rhetoric premised upon a Hobbesian denial of alternative possibilities.

Leviathan and the State of Plague

Critics who have addressed questions of authority in *A Journal* have tended to focus on the status of the individual subject relative to the mandates of the state. The significance of the individual as an actor and vessel of knowledge is limited to deference or resistance to government orders, while the contagion is simultaneously a justification of and metaphor for the dissolution of the private sphere. Writing on the relationship between Boylean corpuscular philosophy and Defoe's depiction of the plague, Thompson argues that the plague undercuts Lockean idea-oriented identity and as such undermines the human subject.⁴³ Discussing the politics of *A Journal*, John Bender describes the self-effacing nature of H.F.'s personal authority: "In H.F. we witness the private self being constituted narratively through isolated reflection on

its relationship to circumstance; individual personality appears as the individual restatement of external authority, as a principle of order in the face of chaos.”⁴⁴ Peter Degabriele, one of the only critics to read *A Journal* explicitly against *Leviathan*, takes a similar outlook: “Defoe’s fiction does not simply demonstrate Hobbesian theories, but marks the survival of a point of resistance to indivisible authority” in the form of private personhood, which itself is compromised by the natural and political state of plague, essentially collapsing the distinction between external and internal personhood.⁴⁵ For DeGabriele, this binding of personal authority is most forcefully accomplished through the persistent theme of burial in the work, particularly the footnoted burial of H.F. himself.

As above noted, there is no editorial apparatus built into the text, hence the poetic explanation first offered by Cynthia Wall, that H.F. “buries himself.” For DeGabriele, this self-burial is a paradigmatic instance of a persistent theme in the text, which at several points addresses the lingering rumor that in 1665 so many died that the living were incapable of burying the dead.⁴⁶ At stake in the refutation of this rumor is the maintenance of an ordered reality wherein the state of plague did not compromise the most foundational aspects of civilization, nor did the historical events of the deaths compromise the integrity of the survivors’ historical reporting (either because of trauma or because public life at the time was so impossible that no one actually observed it). The capacity for credible and official historical knowledge must remain intact. Thus, the text’s precise accounting for the position of H.F.’s body (a burial pit in Moorfields) in a single footnote unifies H.F. as both empirical observer and editorial guarantor, bridging what DeGabriele calls a “split between the position of authority (he who writes as a last man, and is thus an absolute authority who can be doubted but not contradicted) and that of verification (the one who confirms authority, burying uncertainty).” H.F. is both an authentically

experienced witness and a sufficiently impartial historian. Thus *A Journal* enacts the radical union of world and discourse presented in the *Leviathan*, as DeGabriele understands it through the landmark reading of Werner Hamacher as a text that “closes the gap between the order of experience and the order of communication.”⁴⁷ In the previous chapter, I referenced *Leviathan* as an important document in what I described as the seventeenth-century epistemological culture of self-evidence. My reading is heavily influenced by that of Victoria Silver, who describes the work’s logic as follows:

The reciprocal notions of definition and self-evidence mold the verbal form of *Leviathan* as they presuppose its theory, because together they constitute the means by which the reader can validate Hobbes’s argument. Since Hobbes believes that method, the rational form of discourse, can reproduce the shape and quality of our experience in words and so attain truth, words and their configuration assume apparently novel importance in expounding his philosophy...the *form* of argument, whether or not expression and idea cohere to make a rational statement, dictates its self-evidence.⁴⁸

For Hobbes, the capacity of language (discursive and mathematical) to construct reason and thus solidify truth was the most obvious substitute for the form of self-evidence invoked in Boyle’s private-audience experiments, where fact could be translated from direct sensation, and disseminated as indirect or reproducible sensation. While *A Journal* consistently alludes to sensation as the basis of H.F.’s knowledge, analyses like DeGabriele’s unveil the text’s persistent interest in guaranteeing its own credibility as self-evidential by its very existence.

Above I have noted how little H.F. actually “senses” in the novel compared with the amount he has heard about and reasoned on. Also bearing mention is the text’s frequent recourse to an assumed common sense as a means of regularizing H.F.’s testimony as the only possible testimony. He writes, for instance, “It was indeed a lamentable thing to hear the miserable lamentations of poor dying creatures.” The lamentable lamentations collapse external phenomena and H.F.’s sentiment into a single unmediated fact. And if not via figura etymologica,

H.F. portrays his own reactions as beyond his will, not only normative but essentially necessary. Phrases such as “I could not refrain contributing tears”⁴⁹ and “what could be more affecting...?”⁵⁰ abound, conveying a retreat to non-agency. The result, as Bender intimates, is an individual who microcosmically reproduces an ideal social body. I want to argue further that H.F.’s mutable subjectivity serves the political commitment of his historical analysis (that the solution of quarantine originally implemented and set to be implemented in 1722 and beyond is the best one) through narrative, to replace the contingency of historical event with the assurance of law.⁵¹

This process is recognizable in the consistently determined form of counterfactual statements in the text, which in H.F.’s authoritative (which is to say ideally representative) voice, become certainties. H.F.’s above-quoted claim, “Had the shutting up of houses been omitted and the sick hurried out of their dwellings to pest-houses, as some proposed, it seems, at that time as well as since, it would certainly have been much worse than it was,” is a simple counterfactual. It introduces an alternate history, wherein quarantine was not enacted, and, in addition, another course of action was taken—the setting up of sick houses—and as a result the effect of the plague was worse than it was. This assessment gives credence to the present (1722) apparatus of public health—namely the 1721 Quarantine Act—by assuring both that another plague would be less devastating and the devastation of 1665 was more controlled than had previously been imagined. In certain passages, we see the landscape of London physically altered for the better through proleptic comparison, for instance in the description of the burier who must carry bodies by hand because at that time there were not sufficiently wide alleys, an observation made into a “problem” by positivist retrospection. The plague as recounted by H.F. did not so much occur in

1665, pre-fire London as in beta version of the present London, paradoxically both identical and superior.⁵²

Without diving too deep into the *Leviathan*, we might briefly note its conspicuous employment of counterfactual (as an exception from its generally syllogistic structure) wherever modern history is concerned. In one of *Leviathan*'s rare uses of deictic language, Hobbes makes explicit the importance of England's present condition in the construction of his argument. Having commended the Roman Empire for its success in integrating new subjects, he turns the reader's attention to a recent parallel "our most wise King, King James" who endeavored to unite England and Scotland, "Which if he could have obtained, had in all likelihood prevented the Civill warres, which make both those Kingdomes at this present, miserable."⁵³ It is essential to the meaning of Hobbes's text that the English Civil War was preventable at the same time that the universe follows a determinate course. By his logic, the 1707 Act of Union would mark a kind of balancing of the zero-sum forces of the universe thrown off by the miscarriage of the 1603 act. In contemporary analytical philosophy, Hobbes would be considered an actualist in his interpretation of possible worlds, which is to say he is interested in possible actions and states, but only those he could conceive of as having a real chance of occurring. A union between James's kingdoms that could have been guaranteed by more than his person is a counterfactual proposition, but one that very much *could have* happened. This imagined course of events effectively corresponds to the understanding of possible worlds canonically iterated by David Lewis: "ways things could have been."⁵⁴ It is important to note that Hobbes does allow for non-actualized, or un-obtained states in his ostensibly determinist philosophy; far from conceding that the Civil War must have occurred, he treats it as a preventable token of a generally determinate type.

I bring Hobbesian limited possibility to bear on Defoe's fiction because I recognize it as a necessary counterpoint to the often unsatisfying attention critics have placed on his empirical experimentalism, perhaps because of the ways in which it is so thoroughly aligned with unempirical conclusions in his work. While the advent of "hesitation" as a genre staple is one explanation, another is the incompleteness of the distinction between empiricism and less modern forms of judgment that modern critics tend to take for granted. As McKeon notes, "Generally speaking, seventeenth-century writers were able to overlook the incompatibility of Aristotelian probability and the claim to historicity as much as they did because they tended to read the *Poetics* through the spectacle of empirical epistemology."⁵⁵ It is certainly possible to read *A Journal of the Plague Year* as an ideal illustration of this unfaithful translation of probability. While claiming the complete historicity of the work, Defoe attempts to give a sense that the events depicted are in line with a mathematically established matrix of likeliness while repeatedly ignoring or going beyond the principle of chance. In other words, Defoe does not make a necessary choice between poetic probability and aleatory probability, just as he does not fully choose between "true" and "true in general." We could understand aspects of a *A Journal* that are unsatisfying by modern scientific standards in terms of a general incommensurability of poetics and empiricism, but proper attention to the form of Defoe's portrayal of knowledge acquisition reveals compatibilities between epistemologies and aesthetic models now understood to be exclusive. Perhaps there is a degree to which Defoe did not decline to make a choice between probabilities, or between science and aesthetics, but those choices only appear in critical retrospection.

Statistics and/or/as Signs

Dramatic probability, or poetic justice, is not bound to questions of probability as likelihood, but the two may certainly align. The Pie Tavern incident in *A Journal*, for instance, simultaneously upholds one of the text's overarching experimental conclusions, that "the best physic against the plague is to run away from it," while obeying the Aristotelian dictum that in tragedy "good men must not be shown passing from prosperity to affliction."⁵⁶ Though Defoe's presentation of immoral or at least unreformed characters has been recognized as a defining aspect of his verisimilitude, the virtue of H.F. is crucial to *A Journal*'s scientific and political conclusions. H.F. must not die, and he must appear minimally good to avoid scrutiny of his actions and assure the credibility of his writing. There is, however, no observation, much less a visible system in the narrative that would suggest virtue alone is a defense against plague. Aside from running away, and when measures of protection are either not in existence or operation, the only defense against the plague is chance. Defoe does not have to explicitly affirm that divine action kills some people and not others when relevant variables are comparable, because this is how disease really works, and in this case chance can bear an accidental resemblance to Aristotelian probability. As Stephen Halliwell writes of the above passage from the *Poetics*, both Aristotle's specific language and his use of examples make clear that the fortunes and misfortunes portrayed in tragedy are not to be matters of luck or chance, but rather action and choice. This is because "the idea of chance cuts right against the grain of the type of intelligibility which Aristotle prescribes."⁵⁷ While Defoe probably did not compose *A Journal* to fit the classical rubric of tragedy, this conflict between portraying chance and generating intelligibility is clearly understood and navigated at every turn.

Ideal Aristotelian probability banishes chance by situating actions and events within a system of causes that are visible to the audience, while Defoe's causes are, by nature, invisible. *A Journal* stands out among early eighteenth-century fiction for its introduction (or at least suggestion) of a different sort of probability, that is, mathematical. The very purpose of mathematical probability is to generate intelligibility and predictive authority without presenting a complete body of sensory or material data. The mathematician does not need to roll the dice or deal the cards to give a picture of the results. But of course, *A Journal of the Plague Year* is not a work dedicated to statistical analysis, and its introduction of numbers, whether limited by availability of data or authorial decision, ultimately does little to replace experiential data. Nowhere, for instance, does the text offer an estimate of the population of London before the plague's arrival, which would be essential to assessing the degree of risk faced by any given person. Defoe may not have known with any certainty the population of London in 1665 (currently estimated to be around 500,000) but H.F.'s final tally of the dead at "an hundred thousand souls" is accurate, as it is gleaned from the bills of mortality and more likely to be common knowledge. As an amateur statistician, H.F. is able to surmise that more of the poor died than was recorded, that deaths attributed to other illnesses may in fact have been the result of plague, and that many may have died in the course of fleeing the city, but all of these factors speak to the plague's mass more than its probability. This absence seems worth noting because, as we will see in the following chapter, Defoe is fond of assessing likelihood in the form of specific odds, and, even if he could not say whether one in three or one in five died, the plague's statistical resemblance to common games of chance would certainly be compelling.

Another possibility is that Defoe refrains from using the language of mathematical probability where it would seem most evidently applicable because the form of apprehension

generated by such calculation is less suasive in defending public policy than more conventional matters of fact. There are two moments in the text that evoke, to different degrees, the motif of wagering that is so common across Defoe's oeuvre. The first, addressed above, is H.F.'s decision, against the advice of his brother to remain within London. By what argument, H.F.'s brother asks, "is it not as reasonable that you should trust God with the chance or risk of losing your trade, as that you should stay in so eminent a point of danger, and trust Him with your life?" Here chance is rhetorically equated with risk, and both are evoked only in reference to losing in a straightforward application of Pascal's wager. Still, this passage is unique in the work for its use of "chance" rather than the much more common "hazard," which can be used equivalently but more often signifies an avoidable danger (e.g. "they would run any hazard"). This use of chance also carries that moral connotation, though it is employed with reference to H.F.'s business rather than his life. In his brother's understanding, which there is no indication that H.F. does not share, chance exists as a state of unknowing that God's will does not abolish. It is, however, a state that one should not enter, and in this respect, there is something Aristotelian about *A Journal's* narrative stakes. The choice to stay in London threatens to appear as, but is never confirmed to be an unvirtuous one. The second instance is the "coarse stanza" that concludes the work, just before H.F.'s signature: "A dreadful plague in London was In the year sixty-five, Which swept an hundred thousand souls Away; yet I alive!" This verse encapsulates the formal tension of the work that would have the wisdom to be gleaned from the narrative contradict the actions of its protagonist. With that "And yet," H.F. affirms his credibility by stressing his surprise, while denying any personal authority on the question of survival. But beyond this performance of requisite skepticism, this verse is curious because it seems to deliberately portray H.F.'s odds as extremely long. A quick scan might give the impression that there was one

survivor out of a hundred thousand, but of course there is affective value in stressing the largest possible number rather than the “real” odds of one in five. Ultimately this capsule plot summary is so challenging as to banish chance as a means of making the narrative and its conclusions intelligible. It would not be enough to say that surviving the plague is akin to not rolling a certain number, for this would be as unactionable as if death were predestined.⁵⁸

We are left with the question of whether, in *A Journal*, the narrative is a gloss of the numbers or the numbers are a gloss of the narrative. Numbers, in particular, demographic ones, are used in the late seventeenth century, much as they are today, as indicators of proper conduct and invisible laws. It is, from this application of numbers to affairs of state, that the term “statistics” is coined in the seventeenth century. One presumed source for *A Journal* is the 1662 study *Natural and Political Observations ... made upon the Bills of Mortality*, attributed to either Sir William Petty or John Graunt, which suggests that the most obvious application of the bills is the comparison of the numbers dead by various causes with that of the total population in order that citizens “may the better understand the hazard they are in.”⁵⁹ The ends of analysis are not simply this knowledge, but the practice of enlightened action, as, for instance, the author argues that the equal balance of the sexes presents an inherent argument against non-monogamous non-heterosexual relationships, while the prevalence of venereal diseases is a natural argument against promiscuity. This species of argument is extended by John Arbuthnot, whose treatise “An argument for divine providence taken from the constant regularity observed in the birth of bothe sexes” was read before the Royal Society in 1711. Arbuthnot uses public documents to point out the still biologically unexplained phenomenon that the male birthrate is consistently higher though the adult male and female populations are even. In such arguments from numbers, or, very occasionally, algebraic establishment of ratios and constants, the ultimate discovery is

the “footsteps of Divine providence to be found in the works of Nature,” which guarantee that mankind shall not perish.

Written nearly a hundred years after the most deadly plague in London’s history by percentage (1563, at a death rate of 24%), *Natural and Political Observations* treats the plague, or more properly the reports of death by plague, as an insufficiently probable sign.⁶⁰ As a guide of conduct, this document can only offer a statistical argument not to orient one’s actions around fear of the plague. And, as Patey notes, early treatises on mathematical probability routinely addressed issues of irrational fear, for instance the Port-Royal *Logic* stresses that death by lightning occurs in under one in two million cases. This analytic go-to for an unintelligible event appears in *A Journal*, as H.F. cites the cases of people seen to suddenly collapse in the street without apparent reason “as if they had been touched by a stroke of heaven, as men are killed by a flash of lightning.” But this improbable sign (that is, a sign whose significance is in its improbability, thus inviting some providential interpretation) is quickly inverted, as physicians discover that these bodies “always had tokens upon them or other evident proofs of the distemper having been longer upon them than they had otherwise expected.”⁶¹ This movement, from the decidedly improbable to the overwhelmingly certain, which is to say, from living to already dead, characterizes much of *A Journal*, such that the middle ground of probability that would inform any action is difficult to seize. The text, while at times overstating the risk of plague, is still consistently interested in the discrediting of improbable signs.⁶²

Not only does H.F. voice his moral condemnation of quack physicians, practitioners of the occult, and uncredentialed men of faith, for none of these can prevent infection, much less cure the disease, he also casts doubt upon predictions, even if they prove correct. Early in the narrative, H.F. denounces the field of astrology, which in 1722 commanded large audiences but

was not as culturally or politically central as it had been in 1665. H.F. calls out three works of judicial astrology by name, admitting that “Lilly's Almanack, Gadbury's Astrological Predictions, Poor Robin's Almanack, and the like foretold, directly or covertly, the ruin of the city.” While Defoe’s construction of H.F.’s remembrances accurately portrays the prominence of judicial astrology during the Restoration, especially in light of military conflicts with the Dutch and news of plague across Europe, he is also using the opportunity of retrospection to demystify these particular sets of predictions. Lilly’s *Merlini Anglici ephemeris, or, Astrological judgments for the year 1665*, for instance, obtained uncommon status for its claim that, in that year, “diseases like to inflict mankind are Fluxes, gripeing of the Guts, Palpitation of the heart, Pestilence and Plague,” and that it would be “a year of great animosity, Providence inciting men’s minds unto Choler, Wrath, Malice, and the like intemperate Passions.”⁶³ Like the above referenced bibliomancy, judicial astrology in *A Journal* is not debated seriously according to its own merits, but implied to offer only incidental resemblance with real events. H.F. belittles the names of Lilly and Gadbury by associating them with “pretended religious books,” naked self-proclaimed prophets, and, perhaps most damningly, “old wives’ tales” and “the phlegmatic hypochondriac part of the other sex,” or “the dreams of old women, or, I should say, the interpretation of old women upon other people's dreams.”⁶⁴ Despite the vitriol of H.F.’s gendered critique of credulity, seventeenth-century astrology is not qualitatively distinct from contemporaneous physic, and while H.F. wants to put his lot in with the latter, it remains difficult to say why some signs are more significant than others.

Astrology and other folk epistemologies that rival modern experimental science (which is a concept built into Defoe’s education but which is largely conjectural for H.F.) are not the antagonists of empiricism, but rather alternate applications whose referents are different than

those of materialist physicians. Gadbury's almanac for 1671 explicitly positions astrology as a direct competitor of physic, as a practice that explicates celestial influences, whose significance is certain, in order to counter the "errors of [physicians'] common Prognostiques and Symptomes, whether from the pulse, urine, or any other way whatever." The legacy of Galen and Hippocrates thus demand revaluation in accommodation with astrological knowledge of the "energie of the heavens."⁶⁵ The signs most seized upon by astrologers in advance of the plague were the comets of 1664 and 1665, bracketing a lunar eclipse. H.F. notes that the appearance of these comets immediately preceded the first deaths by plague in the city and the great fire, respectively, and admits, "I saw both these stars, and, I must confess, had so much of the common notion of such things in my head, that I was apt to look upon them as the forerunners and warnings of God's judgements." Here Defoe presents a reversal of the typical expression of skepticism followed by belief, as H.F.'s skepticism emerges in response to overindulgence in the reliability of signs.

But I could not at the same time carry these things to the height that others did, knowing, too, that natural causes are assigned by the astronomers for such things, and that their motions and even their revolutions are calculated, or pretended to be calculated, so that they cannot be so perfectly called the forerunners or foretellers, much less the procurers, of such events as pestilence, war, fire, and the like.⁶⁶

The predictive potential of these comets lies not only in their time of appearance (though H.F. is convinced of the orbital nature of comets, even advanced seventeenth-century astronomers like Kepler believed comets to cross the solar system in straight lines), but their apparent qualities, as witnesses "import" that

the comet before the pestilence was of a faint, dull, languid colour, and its motion very heavy, Solemn, and slow; but that the comet before the fire was bright and sparkling, or, as others said, flaming, and its motion swift and furious; and that, accordingly, one

foretold a heavy judgement, slow but severe, terrible and frightful, as was the plague; but the other foretold a stroke, sudden, swift, and fiery as the conflagration.⁶⁷

H.F. discredits such reports on the grounds of their empirical unreliability, associating the disseminators of such accounts with those who claimed to have heard the celestial objects pass, or those who saw “apparitions in the air.” Of all these, H.F. concludes that they “heard voices that never spake, and saw sights that never appeared.”

Defoe, who elsewhere in his fiction and essays gives credence to apparitions or otherwise validates supernatural occurrences according to sensory data, casts doubt not on the assertion but the data itself. While it is evident now that plagues and comets are not causally linked, the astrologists of H.F.’s time were often as scrupulous in their data collection as the experimental philosophers he would have the reader credit. Experience, as Bernard Capp notes, is commonly understood to be “the astrologer’s oracle” among seventeenth-century almanac writers.⁶⁸ While Lilly’s destructive predictions for 1665 are premised on the fiery influence of Saturn, Sir George Wharton extends the scope of this observation by deriving a consistent historical relationship, from the fourteenth century onward, between outbreaks of plague in London and the appearance of Saturn in triplicities with other fire signs. Such abundance of historical data is uncommon in almanacs, but not for lack of interest or presumed utility. The experimental physic practiced by the Royal Society, on the other hand, was just as likely to incorporate arguments from resemblances or apparent signs outside of the body. In a letter to Oldenburg, the schoolmaster and frequent Royal Society correspondent John Burton presents the case of a pregnant woman, who, after being struck on the right elbow by a dead mole thrown by a rival, gave birth to a girl missing her right arm below the elbow, with a malformed hand “obscurely resembling the foot of

a mole."⁶⁹ This is an amusing but characteristic example of the kinds of reports on matters of physic that were routinely submitted to senior fellows and given serious consideration.

If there is a consistent feature of the signs that H.F. credits, it is those that enforce the plague's unknowability, thus enabling a theoretical top-down management of subjects. The response to the comets upsets H.F. not for any inaccuracy (for the predictions, and, of course, the connections drawn in hindsight are correct by their own standards) but rather for leading people away from legitimate clerical and print authorities. Because *A Journal* contains so few instances of directly instructive commentary, its subtle didacticism is directed towards a hypothetical quarantine protocol. Thus Defoe includes an episode exactly resembling the above mentioned Royal Society case-study of a woman who claimed she could sense the presence of a plague through a pain in an old wound, and turns this potential source of knowledge into an argument for ignorance. As an illustration of why it is "impossible in a visitation to prevent the spreading of the plague by the utmost human vigilance: viz., that it is impossible to know the infected people from the sound, or that the infected people should perfectly know themselves,"⁷⁰ H.F. offers the anecdote of a man who would know the infected by the signal that his wound would smart. No explanation or other discussion of the probability of this claim follows, as is common across the work in reference to unusual empirical claims, rather, H.F. implicitly credits the story for its payoff, which is not that this man was proven correct by the death of some relation, or that he used this sign to protect himself and others, but that "he found his wound would smart many times when he was in company with such who thought themselves to be sound, and who appeared so to one another." A perfect empirical means of apprehending the presence of infection before it becomes fatally visible is exploited for seemingly oppositional ends: to reinforce the plague's undetectability. The conclusion that "promiscuity" should be avoided is a

reasonable one, but it shifts the responsibility of probabilistic thinking from empirical subjects to a disembodied collectivity, for, as Thompson argues, “interiority harbors impersonal and unverifiable danger.”⁷¹ That subjects are not able to verify even their own material status is, for Thompson, an argument against the early novel’s supposed “turn inward” towards an interiorized basis of character, as theorized by Watt and Lukács. While the condition of the plague makes individuals into agents of a singular, external plot (that is, the visitation itself), it also establishes a dialectical relationship between the specificities of individual experience and the visibility of collectivities as such. Defoe’s narrative follows this dialectic loop between the street level domain of experiential fact and the abstracted, overhead view of statistical probability. Where experience becomes (occasionally) a thrillingly successful basis for knowledge in *Robinson Crusoe*, the plague makes experience both the germ of all insight and something ultimately insignificant. Probability thus appears not as a concentration or multiplication of knowledge, but something more like a trace or shadow.

That State of Mediocrity: Lockean Probability

A Journal is explicitly Lockean in its form and in its ostensible intent. The work is concerned with recording the “sights” of the plague, which “fill” H.F. with “very serious thoughts.” The narrative’s main event, if there can be said to be one, is the furnishing of H.F.’s transparent consciousness with information, and the various levels of thinking, reasoning, and deliberating he performs. His written remembrances thus provide an opportunity for a virtual witnessing of the thing itself, but more importantly, an opportunity to internalize this visual data in a like manner. *A Journal* is, then, the best possible manifestation of the hypothetical it poses: “Were it possible to represent those times exactly to those that did not see them, and give the

reader due ideas of the horror that everywhere presented itself, it must make just impressions upon their minds and fill them with surprise.”⁷² This passage contains its own measure of surprise, as when H.F. speaks of a “just impression,” he means not an accurate sensation of the thing witnessed, but, indeed, a feeling of surprise. Above we have seen how *A Journal* insists upon the necessity and typicality of H.F.’s sentiments, but here the end of the empirical project of writing is framed not as personal apprehension but a shared aesthetic distance.

Though perhaps no work of the eighteenth century is more invested in empiricism as a basis for verisimilitude, *A Journal* ultimately serves as counterevidence to the possibility of Watt’s “individual apprehension of reality through the senses.” This widespread failure of apprehension (the plague evades sense, the sick do not know themselves, a visual account yields no understanding, only affect) is not, for Defoe, a failure of probability, but an understanding of probability in properly Lockean terms. Locke’s remarks on probability in *An Essay Concerning Human Understanding* are among the earliest and most influential attempts to define probability as an epistemological category after the publication of the Port Royal *Logic*. What distinguishes Locke’s definition from earlier seventeenth-century definitions is that, while these antecedent accounts largely describe probability as something very unlike knowledge, as a scale defined by different types of propositions, Locke makes probability contiguous with knowledge, largely to marginalize the latter.

Though undoubtedly familiar with the most recent advances in the mathematics of chance, Locke nowhere explicitly addresses mathematical probability as a potential epistemology. Rather, he seems to consider it under the umbrella of “Testimony,” which is to be pitted against “Experience” in judgements of credibility. Mathematical knowledge, for Locke, belongs to that rarified, “narrow” category of the certain, and its application to matters wherein it

is the simultaneous replacement for and competitor of experience cannot carry over any of this authority:

The understanding faculties being given to man, not barely for speculation, but also for the conduct of his life, man would be at a great loss if he had nothing to direct him but what has the certainty of true knowledge. For that being very short and scanty, as we have seen, he would be often utterly in the dark, and in most of the actions of his life, perfectly at a stand, had he nothing to guide him in the absence of clear and certain knowledge.⁷³

Locke further compares this limited state of certainty with “broad daylight,” while the majority of life is spent in a state of “twilight,” a “state of mediocrity,” which, by daily labor, man might improve. The want of knowledge—which, excepting the “true knowledge” of intuition is itself provisional—is supplied by “judgement,” defined as “assent to probability.” Sensory experience is beyond probability, but experience mediated by report invites consideration of one’s own experience. Thus, reports of things never seen by the judging subject cannot help but be deemed improbable, in Locke’s example, a Dutch ambassador is called a liar by the otherwise credulous king of Siam for mentioning that he has seen an elephant walk on ice. This should correspond, more or less, to the state of “surprise” H.F. means to invoke with his narrative. But the apparatus of fiction, through which Defoe multiplies evidence, draws upon the inherent authority of publication, and incorporates various modes of “internal” probability, allows Defoe both to establish the typicality, or “true in general” status of claims that would otherwise be mere hearsay, and to internalize the incredulity associated with surprise.

Defoe’s fiction, as we shall see in the following chapter, often prefers to situate itself in the low end of probability, to court this unbelief and stage reversals that embrace the potential of knowledge to unbecome and become again. In courting disbelief, however, these fictions signal the weak, dim, and mediocre nature of that faculty in the reader. Defoe’s version of realism is

built upon a persistent signaling to the reader that the edifices of judgement are provisionally assembled, often synchronously with the act of reading. The act of virtual witnessing constituted by reading fact or fiction (which are conflated by Defoe anyway) prove inadequate to apprehend either the workings of providence or even the natural patterns of cause and effect that adhere at any given moment. The fact, for Defoe, is not placed on a scale above the probable and further above the improbable, but at the center of a dialectic. Critics of Defoe's fiction, most famously Swift, may easily mock his presentation of fact without contesting his calibrations of the probable.

Notes

¹ See Barbara Foley, *Telling the Truth: The Theory and Practice of Documentary Fiction* (Ithaca: Cornell University Press, 1986). See also Robert Mayer, *History and the Early English Novel: Matters of Fact from Bacon to Defoe* (Cambridge: Cambridge University Press, 2004) 150-156

² McKeon, *Origins* 121

³ Several critics, including Cynthia Wall and Peter DeGabriele have referred to this textual gesture as H.F. burying himself. See below.

⁴ My understanding of "hesitation" is drawn from Svetan Todorov's use of the term to describe a represented mental state that applies typically empiricist attitudes like skepticism and denial of the supernatural to a direct experience of the supernatural, verified empirically. *A Journal*, in this sense, portrays the reverse process, of the supernatural made natural. See Tzvetan Todorov, *The Fantastic: A Structural Approach to a Literary Genre* (Cleveland: Press of Case Western Reserve University, 1973) chap. 2.

⁵ His full remarks in the *Essay Concerning Human Understanding*: "This way of getting and improving our knowledge in substances only by experience and history, which is all that the weakness of our faculties in this state of mediocrity which we are in in this world can attain to, makes me suspect that natural philosophy is not capable of being made a science. We are able, I imagine, to reach very little general knowledge concerning the species of

bodies and their several properties. Experiments and historical observations we may have, from which we may draw advantages of ease and health, and thereby increase our stock of conveniences for this life; but beyond this I fear our talents reach not, nor are our faculties, as I guess, able to advance.” Locke, *An Essay* 645. At the conclusion of this chapter, I address the ramifications of this “mediocre” state for the articulation of fictional probability in the early novel.

⁶ Thus, in his landmark reading of the episode (that is to say, Shapin and Schaffer’s study), Bruno Latour identifies the pump itself as the “real hero.” Bruno Latour, *We Have Never Been Modern* trans. Catherine Porter (Cambridge: Harvard University Press, 1991) 17

⁷ For Thompson, the prevalent discourse of realism as transparency has perpetuated a rhetorical equivalence between scientific realism, the position that the objects of scientific knowledge exist and are accessible, and early novelistic realism, which she understands, with reference to Watt, as something equivalent to McKeon’s naïve empiricism. Helen Thompson, *Fictional Matter* (Philadelphia: University of Pennsylvania Press, 2017) 1

⁸ Ian Watt, *The Rise of the Novel* (Berkeley: University of California Press, 1957) 14

⁹ *Leviathan and the Air-Pump* 147

¹⁰ *Ibid* 67

¹¹ These types of experiments, qualitatively different as they are from twentieth-century experiments with electron microscopes, do not rest on a merely “representationalist” paradigm, to use Hacking’s term, where the corpuscular or atomic object is completely imperceptible, which is to say, Boyle’s demonstrations of air’s qualities are of a different order than the observations of pre-Socratic materialists. See Ian Hacking, *Representing and Intervening* (Cambridge: Cambridge University Press, 1983).

¹² Robert Boyle, *Medicinal Experiments, Or, a Collection of Choice Remedies: Chiefly Simple and Easily Prepared, Useful in Families, and Fitted for the Service of Country People* (London: 1693) 6. Hereafter cited as *Medicinal Experiments*, unless other editions are specified.

¹³ Boyle, *Works of Robert Boyle* ed. Hunter and Edward B. Davis, Vol. 3 (London: Pickering and Chatto 1999) 442

¹⁴ John Beale, Letter to Robert Boyle, 4 June 1665

¹⁵ *Medicinal Experiments* (1693) 67-68

¹⁶ Robert Boyle, *Medicinal Experiments, Or, a Collection of Choice Remedies: Chiefly Simple and Easily Prepared, Useful in Families, and Fitted for the Service of Country People* (London: 1692) A3-A5

¹⁷ *Medicinal Experiments* (1693) A4

¹⁸ Furthermore, as McKeon argues, the exoteric rather than esoteric culture of trial in the early modern period may be reflective of an emerging sense of “the parallel between experimental technique and the phenomena it sought to know.” See McKeon, *The Secret History of Domesticity: Public, Private, and the Division of Knowledge* (Baltimore: Johns Hopkins University Press, 2009) and William Eamon, *Science and the Secrets of Nature: Books of Secrets in Medieval and Early Modern Culture* (Princeton: Princeton University Press, 1994)

²⁰ *Medicinal Experiments* (1693) A5

²¹ *Ibid.* A8

²² For two recent examples, see Travis Chi Wing Lau, “Defoe Before Immunity: A Prophylactic *Journal of the Plague Year*,” *Digital Defoe: Studies in Defoe & His Contemporaries* 8.1 (2016) 23-39 and Helen Thompson, “‘It Was Impossible to Know These People’: Secondary Qualities and the Form of Character in a Journal of the Plague Year,” *The Eighteenth Century* 54.2 (2013) 153-167

²³ See Jesse Molesworth. *Chance and the Eighteenth-Century Novel: Realism, Probability, Magic* (Cambridge: Cambridge University Press, 2010) 102. Molesworth's analysis aligns with that of Thomas Kavanagh in *Enlightenment and the Shadows of Chance: The Novel and the Culture of Gambling in Eighteenth-Century France* (Baltimore: The Johns Hopkins University Press, 1993)

²⁴ See G. A. Starr, *Defoe & Casuistry* (Princeton, N.J.: Princeton University Press, 1971) and J. Paul Hunter, *Before Novels: The Cultural Contexts of Eighteenth-Century English Fiction* (New York: W.W. Norton, 1990)

²⁵ See Landa's introduction to *A Journal of the Plague Year* (London: Oxford UP, 1969), xxi. Further references to the text are to *A Journal of the Plague Year: Authoritative Text, Backgrounds, Contexts, Criticism* ed. Paula Backscheider (New York: W.W. Norton, 1992)

²⁶ The above quote is from the 1721 John Quincy translation, Defoe's direct source. Nathaniel Hodges and John Quincy, *Loimologia: Or, an Historical Account of the Plague in London in 1605 ; with Precautionary Directions against the Like Contagion* (London: 1721) 22

²⁷ *A Journal* 192

²⁸ The passage H.F. opens to is Psalm 91, which begins "I will say to the LORD, "My refuge and my fortress, my God, in whom I trust." For he will deliver you from the snare of the fowler and from the deadly pestilence." The improbable specificity of the reference convinces H.F. immediately and completely: "I scarce need tell the reader that from that moment I resolved that I would stay in the town, and casting myself entirely upon the goodness and protection of the Almighty." But as John Richetti notes, leaving aside the specific applicability of the passage, the advice to trust in God that H.F. finds in this Psalm is relatively conventional across scripture, and, as H.F.'s brother has earlier suggested, the invocation of divine deliverance is not a specific injunction one way or another. See *Defoe's Narratives* (Oxford: Clarendon, 1975) 235

²⁹ *A Journal* 47

³⁰ *Ibid.* 156

³¹ *Ibid.* 52

³² *Ibid.* 55

³³ *Ibid.* 48

³⁴ Riccardo Capoferro, *Empirical Wonder: Historicizing the Fantastic, 1660-1760* (Bern: Peter Lang, 2010) 72-73

³⁵ Keith Thomas, *Religion and the Decline of Magic* (New York: Scribner, 1971) 85

³⁶ "When any one bought a joint of meat in the market they would not take it off the butcher's hand, but took it off the hooks themselves. On the other hand, the butcher would not touch the money, but have it put into a pot full of vinegar, which he kept for that purpose. The buyer carried always small money to make up any odd sum, that they might take no change." *A Journal* 41

³⁷ In *Due Preparations for the Plague*, an essay published two months before *A Journal*, Defoe mentions the possibility that vinegar may block "poisonous or infectious effluvia."

³⁸ *A Journal* 67

³⁹ *Ibid.* 23

⁴⁰ *Ibid.* 217

⁴¹ Richard Mead, a physician and author of *A Short Discourse concerning Pestilential Contagion, and the Method to be used to prevent it* (1720), another important source for Defoe, argues that the plague must

operate through natural causes, and not as the direct action of God, because, given how many innocent die, God could not want to make his will so inscrutable. See Mead, *Medica Sacra* trans. Thomas Stack (London: 1755) 31 and Thomas 108.

⁴² *A Journal* 175

⁴³ See Thompson, “‘It Was Impossible to Know These People’”

⁴⁴ John Bender. *Imagining the Penitentiary* (Chicago: University of Chicago Press, 1987) 72

⁴⁵ See Peter DeGabriele, "Intimacy, Survival, and Resistance: Daniel Defoe's a Journal of the Plague Year" *ELH* 77.1 (2010) 1-23

⁴⁶ Hodges provides a subtler account in his *Loimologia*, claiming that "the Number of Sextons were not sufficient to bury the Dead." *Loimologia* 18

⁴⁷ DeGabriele 19

⁴⁸ Victoria Silver, "The Fiction of Self-Evidence in Hobbes's *Leviathan*," *ELH* 55.2 (1988) 362

⁴⁹ *A Journal* 93

⁵⁰ *Ibid.* 136

⁵¹ In *Discipline and Punish*, Foucault outlines his concept of panopticism through the anecdote of a plague, which both diffuses power and strengthens the mandate of the state. See Foucault, *Discipline & Punish: The Birth of the Prison* trans. Alan Sheridan (New York: Vintage, 1977) 188-195

⁵² Hodges draws an explicit equivalence between the plague and the fire, according to their material cause and transmission, as well as their preventability: "...and meerly for Want of confining the Persons first seized with it, the whole City was in a little Time irrecoverably infected. Not unlike what happened the Year following, when a small Spark, from an unknown Cause, for Want of timely Care, increased to such a Flame, that neither the Tears of the People, nor the Profusion of their *Thames*, could extinguish; and which laid Wast the greatest Part of the City in three Days Time: And therefore as there happens to be no great Difference between these two grievous Calamities, this Mention of them together may not be improper; and the more especially, because by a like irresistable Fate from a Fever and a Conflagration, both the Inhabitants and their Houses were reduc'd to Ashes." *Loimologia* 2

⁵³ *Leviathan* 138

⁵⁴ David Lewis, *Counterfactuals* (Malden: Blackwell, 1973) 84-85. See below, chapter 4.

⁵⁵ *Origins* 54

⁵⁶ *Poetics* 44

⁵⁷ Stephen Halliwell, *Aristotle's Poetics* (Chicago: University of Chicago Press, 1998) 209

⁵⁸ More specifically, H.F. refers to such a fatalist attitude as "Turkish Predestination": "Then, with a kind of a Turkish predestinarianism, they would say, if it pleased God to strike them, it was all one whether they went abroad or stayed at home; they could not escape it, and therefore they went boldly about, even into infected houses and infected company; visited sick people; and, in short, lay in the beds with their wives or relations when they were infected. And what was the consequence, but the same that is the consequence in Turkey, and in those countries where they do those things—namely, that they were infected too, and died by hundreds and thousands?" *A Journal* 152

⁵⁹ See Patey 72

⁶⁰ The 1665 plague is estimated to have killed around 20% of the city's original population (the aforementioned 100,000 out of 500,000) while 40% (200,000) fled the city. Dorothy Moote and Lloyd Moote, *The Great Plague: The Story of London's Most Deadly Year* (Baltimore: Johns Hopkins University Press, 2004) 11.

⁶¹ *A Journal* 134

⁶² Sudden death is also identified as an improbable but not supernatural occurrence in Hume's *Enquiry*. Hume draws a fine line between things ever observed and things never observed, for instance a man returning from the dead, to distinguish a natural event and a miracle. See Hume, *An Enquiry Concerning Human Understanding* ed. Eric Steinberg (Indianapolis: Hackett, 1993) 76-77

⁶³ William Lilly, *Merlini Anglici Ephemeris, Or, Astrological Judgments for the Year 1665* (London:1665) A4

⁶⁴ *A Journal* 21-22

⁶⁵ See Bernard Capp, *English Almanacs 1500-1800* (London: Faber and Faber, 1979) 184

⁶⁶ *Ibid.* 21

⁶⁷ *Ibid.*

⁶⁸ Capp 186

⁶⁹ John Burton, Letter to Henry Oldenburg, December 1667

⁷⁰ *A Journal* 151

⁷¹ Thompson 132

⁷² *A Journal* 18

⁷³ Locke, *Essay* 652

Chapter Three

Projects and the Limits of Probability

H.F.'s verse conclusion of *A Journal of the Plague Year*: "A dreadful plague in London was/ In the year sixty-five,/ Which swept an hundred thousand souls/ Away; yet I alive!" marks his survival as a low probability occurrence. But beyond that, it belongs to a pattern throughout the work of using numbers rhetorically to lend credibility to a story that those numbers do not tell. *A Journal* would seem an ideal instance of a work drawing upon what Patey calls "external" probability, the sense of probability generated by a text's adherence to the physical laws and patterns of cause and effect that adhere in the real world. By writing around actual historical data points, Defoe seemingly draws the contours of his (loose) narrative from the world itself. As we have seen, however, H.F. implies connections between the behavior of people, the policy of the government, and the rise and eventual decline of the death tolls that are not meant to stand to rigorous analysis. The reasons for this absence of strict correspondence are that a narrative that properly corresponded to the statistical picture drawn by the bills of death would have its narrator die before compiling his observations and, more significantly, that a scientific understanding of the plague is precisely what renders it impossible to narrate. The action of the plague as a system of corpuscles occurs at a level impenetrable to Defoe's empirical eye. The final verse enacts the only option for the text's claim to historicity: acknowledging the improbability of its premise according to external standards in order to defend the data on which those standards are built.

This chapter will continue the previous chapter's interest in the unwieldiness of external probability in early novelistic fiction. The problem is not simply that the canons of probability

established by Enlightenment natural philosophy preclude interesting narratives, but that Enlightenment natural philosophy itself is often caught between recognizing probability as a proper epistemology and insisting on materiality and direct empiricism as the only worthwhile guarantors of knowledge. The result is that fictional narratives that attempt to embrace the methods of the New Science waver between the largely incompatible claims of probability and historicity, and, to complete the cycle, late seventeenth- and early eighteenth-century works of “experimental” philosophy regularly use poetic or narrative probability to substantiate ideas and relationships that are not susceptible to either empirical or mathematical modes of proof (for instance, Bacon and Wilkins using ancient myth and recent fiction as evidence of the physical possibility of flight, or Boyle attributing his physical weakness to his reading of “eastern characters.”). A persistent charge against seventeenth- and eighteenth-century natural philosophers and experimentalists is that their claims resembled fictions. Perhaps the leading voice of this critique is Jonathan Swift, who, between *A Tale of a Tub* (1704), *Gulliver’s Travels*, and assorted satires like the explicitly Boylean “A Meditation upon a Broomstick” (1701), dutifully reduces the contents of the New Science to its constituent language, which is revealed to be both opaque and pliable.

In this chapter, I will argue that Defoe is not incapable of this skepticism, and that, far from naively imitating the style of the Royal Society to suggest the external probability of his fictions, Defoe embraces the ambiguity and inherent fictionality of thinking proleptically or counterfactually. Central to this understanding is a reading of Defoe’s defense of projectors as a key to interpreting the depictions of probability in his novels. Because Defoe’s defense of projectors admits all the ignorance and uncertainty posited by Swift’s ostensible critique of the same figures, I read the two authors as more allied than commonly thought in their approach to

questions of probability, and recognize traces of both in the writing of Hume, whose critique of induction invites an understanding of real events as equivalent to fictional ones.

In aligning Defoe and Swift on the question of probability, I aim to deconstruct longstanding, tacitly accepted assumptions about the relationship between mathematical, experimental, and narrative probability during the English novel's rise. As we shall see, Defoe's insistence on empirical fact is largely evoked in opposition to probability in a mathematical sense (that is, probability conceived of as likeliness to occur under specified conditions). This opposition does not, however, preclude Defoe from being earnestly interested in probability. Defoe's fictions ultimately promote a dissociation between empirical observations and probability so that the latter may be more properly understood, not discounted. The case is very much the same for Swift, who produces this dissociation by courting incredulity rather than credulity. Defoe and Swift thus refute the possibility of the metric now understood as external probability by stressing the variability and contingency of probability both inside and outside of fiction. Their fictions do not represent what is likely to happen, even in given scenarios, but rather offer training grounds for assessing the uses and abuses of probabilistic thinking.

Vindicating the Improbable

In Defoe's novels, mathematical probability is most visibly invoked in opposition to the events narrated. Perhaps the boldest of these invocations is Crusoe's assertion that "it was ten thousand to one" that he should have seen the famous footprint in the sand, which he initially believes to be the work of the devil.¹ While the round number is recognizably symbolic², Crusoe shows some of his calculations. He apparently understands every factor potentially precluding his discovery as a multiplier, thus his happening to be on a part of the island far from his

residence, and the persistence of the print against the forces of wind, rain, and tide conspire to determine the statistical miracle. As Paul Alkon and Jesse Molesworth have noted, Crusoe's shipwreck predates the advances of the Port Royal mathematicians, let alone their integration into English schooling.³ While Crusoe may have been a gambler, the language is unmistakably Defoe's. Such impromptu calculations, however rough and conjectural, are warranted in the case of H.F., who deals in data, but this quantitative turn in *Robinson Crusoe* appears more conspicuously imported.

One explanation for the appeal of odds-setting (even retrospectively) is that it calls to mind the thrill of a wager, a victory determined before any prospective loss could be assessed. An intuitive application of probabilistic calculation to fiction would be to accord narrative and mathematical probability, but it is hardly surprising that Defoe should favor the "strange" and "surprising" over the typical and predictable. Hence Crusoe survives capture, shipwreck, illness, cannibals, and wild animals, and emerges with an arguably even more improbable fortune intact, while H.F. strolls through the epicenter of the plague unharmed, Moll Flanders finds herself wed to her brother, and Roxana unknowingly employs her cast-off daughter. Such shocking coincidences, which run the spectrum from propelling narratives forward to being indispensable to their existence, would not be out of place within a range of genres now understood as antecedent to or incompatible with the realism of which Defoe is credited as a pioneer, if not for Defoe's conspicuously mathematical voicing of skepticism. In several of these cases, Defoe's narrators highlight their erstwhile agnosticism to affirm that providence, and not writerly artifice, are behind these twists. The internal improbability of these situations (their unlikelihood according to the understanding of characters and/or author figures) is counterbalanced by an insistence that in the external world, improbable events, which may even be deemed miraculous,

really do occur. To the degree that Defoe both calls out the event in question as a deviation from the regular course of events and signals the deviation as such within the world of the text, the footprint episode is a casebook instance of Todorovian hesitation, but it also explicitly undermines the logic of hesitation as a function of realism.

The discovery of the footprint does mark a turn in the plot, but Crusoe's impromptu calculations, before they are revealed to be greatly overstated, are immediately thrown into contradiction. Initially believing the print to be the work of the devil, Crusoe sets his mind to work comprehending the low probability of his seeing it while simultaneously understanding that his seeing it is essential to the devil's plot, and thus an inevitability. Crusoe, on behalf of the reader, analyzes narrative events according to their likelihood of occurring outside of that narrative. Just what probability is referenced by the calculation is difficult to ascertain. Not knowing of the presence of other people on and around the island, he has no frame of reference (to say nothing of a statistic) for his chances of seeing a footprint at any location. His years of experience, that is, his repeated non-observation of signs of human presence (Hacking's "long observation"), might have given him a sense of extremely low but non-zero odds in the range of one in ten thousand, but not according to the factors he lists. Rather, the odds he offers are more properly the odds that he would see a footprint placed by the devil on that specific beach, having been placed at a single, specific time, without the Devil having necessarily accounted for Crusoe's habits (but, of course, knowing Crusoe to be on the island). Crusoe understands every variable involved in his seeing or not seeing the print to multiply the odds, and thus he lists factors like the height of the tide and his frequency of visit to that beach as though they would all conspire to make a single footprint, left for the purpose of Robinson Crusoe seeing it, a near impossibility. The odds of such an occurrence are of course irrelevant because there is no

accounting for the potential sources of the footprint or the frequency with which footprints may appear, and instead Crusoe takes both the print's existence and his seeing it to be singular rather than potentially replicable events. The footprint was not the work of the devil, and had it been, the encounter necessarily would not have obeyed any strict laws of chance.

The presence of specific odds in this case underscores Crusoe's awe in the moment and reinforces the readerly contract of consistent factuality. Both these effects could be produced, however, if the event that transpired were in fact the same one for which the odds were given. H.F.'s survival, and, to a lesser degree, Moll Flanders's incest, are events whose low probability establishes their narrative value, insofar as these narrators derive meaning precisely from their sense of good or ill fortune.⁴ While Defoe does not accord the events of his narratives to any wider sense of what would happen, his portrayal of strange, surprising, fortunate, or unfortunate events is informed by an overarching sense of probability (in other words, he seems to posit that, were the worlds of his novels considered as experimental set-ups, the events depicted would happen very rarely, but not never). The appeal of such narratives is very much akin to the appeal of gambling, as the narrators face the precarity of their positions knowingly and emerge with their lives and fortunes intact. The same could largely be said of *Robinson Crusoe* if it were not for the ever-wavering baseline of expectable outcomes. Bound by two interpretations that would upend his probabilistic language—the presence of natives, which significantly increases the probability, and divine providence, which would place the event beyond mathematical assessment, Crusoe's long odds refer to nothing but the sensation of a remarkable occurrence. Ultimately, Crusoe is able to close the logical loop he has opened by reasoning that all the factors contributing to the denominator of ten thousand are overstated because he simply has not seen who left it. If an “autonomous” human actor, the cause of the footprint is more probable than

Crusoe believes, and if God or the Devil, the footprint's purpose is to alter Crusoe's empirically derived sense of knowledge from probability. Providence, for Crusoe, is only visible against probability, though he knows that this is a limitation of his cognition. Crusoe's narration, by Defoe's design, allows the footprint to remain suspended between the normal and the conspicuously abnormal.

Rather than simply depicting the thrillingly improbable, Defoe works persistently to extend the domain of the strange and surprising and thus to aesthetically condense the spectrum of probability. In Defoe's narration, the same phenomena are liable to be logical and confounding. In his discovery of barley growing on his island, for instance, not only does Crusoe vacillate between the natural and supernatural explanations for its appearance, the plant itself is defamiliarized by this vacillation. As the chain of events becomes more and more apparent to Crusoe, his narration presents a continuum from astonishment to recognition and back again, as the "green stalks," become "perfect green Barley," before ultimately revealing themselves as "European, nay, our English Barley."⁵ This process of factualization via the proliferation of specific data points ought to confirm the most mundane explanation, but, through Crusoe's layering of ignorance and knowledge, the resulting fact becomes an occasion of estrangement and wonder.⁶ In her analysis of the episode, Sarah Tindall Kareem ascribes Crusoe's maintenance of his initial surprise, even after reflection, to Defoe's protestant valuation of everyday miracles.⁷ Much as Crusoe undergoes a conversion-like experience in learning the satisfaction of self-manufacture, his approach to the natural world involves constant close observation and reassessment, so that mystery and familiarity are put into a dialectical rather than hierarchical relationship. Defoe's heroes are "enchanted"⁸ to the degree that their experiences are fortunate and abounding in coincidences, and they ultimately adopt a lasting

belief in providence because they hold these occurrences up to agnostic (occasionally mathematical) modes of assessment. Defoe's version of verisimilitude thus warrants attention because it is both dedicated to a sense of consistency and normalcy and selectively dismissive of these as epistemologies.

Few of the major, plot-shaping events that take place in Defoe's novels are understood by characters or can be understood by readers as being likely (by which I mean relative to the actual world, where they are presented as taking place, i.e. in terms of "external" probability). His version of verisimilitude operates not only through the counterbalancing presence of explicit skepticism, but by the persistent suggestion that for *every* event there exists a framework within which it is unlikely. Thus while many events must be understood as instances of tremendous luck or localized miracle, even barley being barley and not any other plant is a kind of victory over the odds (that is, a *mélange* of odds evoking some alternate universes in which Crusoe did not shake out a bag of seeds). In such instances, Defoe evokes a similar form of negotiation as Hooke in his *Micrographia*, in which the wonder of the observer seeing everyday objects transmuted into unrecognizable forms is taken as a given, so that the author may subsequently dismiss this wonder as unwarranted, or rather, as a reaction that would not be warranted were the reader to be a more sophisticated natural philosopher. Hooke, through such employment of litotes as "we need not wonder that the colours appear so lovely in the one, and so dull in the other, if we view but the ting'd cylinders of both kinds with a good Microscope," or "we need not much wonder at those innumerable clouds of Locusts with which Africa, and other hot countries are so pestred, since in those places are found all the convenient causes of their production," shepherds amateur experimentalists through their shock, presumably arising from the absence of sufficient explanation, to a state of contentment upon having successfully reestablished stable

relationships between empirical phenomena and habitual understanding. In a like fashion, Defoe foregrounds abnormalities so that he may destabilize and potentially rearrange the conditions of normality that reader and character would assume.

On the question of odds, more critical attention has been paid to Defoe's mathematical rhetoric itself than the flaws of his calculations, namely, that they are offered retrospectively. This propensity for highlighting the low probability of events that have already occurred extends beyond the domain of fictional events. For instance, in his *Essay on Projects* (1697), Defoe describes the successful treasure hunt carried out by William Phips between 1683 and 1686 as follows:

Witness Sir William Phips's voyage to the wreck; it was a mere project; a lottery of a hundred thousand to one odds; a hazard which, if it had failed, everybody would have been ashamed to have owned themselves concerned in; a voyage that would have been as much ridiculed as Don Quixote's adventure upon the windmill. Bless us! that folks should go three thousand miles to angle in the open sea for pieces of eight! Why, they would have made ballads of it, and the merchants would have said of every unlikely adventure, "It was like Phips's wreck-voyage." But it had success, and who reflects upon the project?⁹

To this day, the anomalous and, in the long-term, dangerous quality of Phips's success is assumed, and is reflected upon precisely as such.¹⁰ The lack of a clear referent for "the project" in Defoe's final question (whether the project is Phips's specific mission or the project of treasure hunting generally) evokes two counterfactual possibilities, that the mission had failed and become a benchmark for other unsuccessful endeavors, and, more curiously, that the mission's success has in reality rendered it ordinary and thus ignored by the very adventurers it inspired. This latter claim is more of a hyperbole than a proper possible world, in that it describes a rhetorical rather than historical state of affairs. As Defoe's account ought to testify, Phips's success gave rise to wider forms of adventuring with significant financial backing. Though Phips was certainly fortunate, the replication of such success must be premised on the fact that he did

not simply win a lottery of a hundred thousand to one odds, but executed an operation deemed sufficiently possible (if not probable) to be worth attempting. In evoking these odds with reference to a counterfactual failure, Defoe manages to tout the reasonableness of adventuring while evoking the thrill of irrational gambling, so that the hypothetical folly would be loss rather than wagering.

In his glossing of this reference, Molesworth reads Defoe as offering a straight expression of the “wonder of actually winning such a lottery.”¹¹ This reading is accurate to the style of Defoe’s narration but not to its precise terms. Defoe indeed advocates for the establishment of an actual lottery, thus endorsing the diverting aspect of games of chance—specifically in order that the state may profit from the revenue of their losses—but his defense of “projects” operates through an undermining of the epistemological and moral distinctions between traditionally understood lottery-playing and the undertaking of projects. Simply, Phips did not “win” any more than did Crusoe by discovering the print or the barley. All of these events occurred, and their occurrence does not simply go against the odds, but gives lie to the assignment of such odds. What warrants further illumination is the disingenuousness of Defoe’s wagers, which, because they are made after the fact, call attention to their rhetorical nature (this is what I refer to as “the rhetoric of probability” as opposed to probability proper). While Defoe fleetingly evokes the thrill of an all but mathematically impossible victory (anticipating the current slogan of the New York State Lottery, “Hey, you never know!”¹²), he more fundamentally dilutes probability as a knowable and practicable form of knowledge.

An Essay Upon Projects is a valuable document not only for its insights into Defoe’s interests and sense of intellectual history, but also because it offers a key to the motif of unlikely events in his novelistic career. On its own terms, and especially as the object of Swift’s parody,

Defoe's fiction appears stiflingly limited by its appeal to external standards of probability. Passages like the above description of Phips's voyage, however, offer a glimpse of Defoe as a thinker whose sense of fiction is closer to being too expansive than too limited. In his discussion of "projects" and "projectors," the foundations of Defoe's occasional skepticism become visible, as he is able to remark upon historical and scriptural events as though they were fictions. In undermining the inchoate canons of probabilistic thinking, Defoe emerges as a rhetorical ally of Swift's and both emerge as early adopters of the Humean principle that probability is an idea that exists nowhere but in a man's head. In what follows, I argue that Swift's monumental satire of projectors actually rehearses Defoe's skeptical defense, such that the projector emerges as a figure for mankind's necessary ignorance of cause and effect.

The Vice of Projection

Modern readers are likely to have first encountered the "project" as an institution and the "projectors" who generate them as objects of satire in Part III of *Gulliver's Travels*. Following his voyage to Laputa, Gulliver visits what is initially identified to him as the "Academy of Projectors of Lagado" and later referred to simply as the "Academy of Lagado," whose members are referred to by both the clerical title of "Professors" and the pseudo-academic title of "Projectors," where the latter seems to subsume the former. This broad association between the specific *métier* of projection and the pursuit of knowledge generally has caused confusion among both eighteenth-century and modern readers as to the scope of Swift's critique. In the last few decades, critics have progressively narrowed the target of the satire from experimental philosophy in general to more subtle aspects of epistemology and rhetoric specific to the increasingly historicized category of the projector. Swift did not need to tease out the unsavory

connotations of the word. Like their cousins the virtuosos, projectors are more ubiquitous as subjects of ridicule than as an earnest, self-identifying group.¹³ The two are criticized on more or less equal grounds in John Wilson's *The Projectors* (1665) and Thomas Shadwell's *The Virtuoso* (1676), among numerous other comedies and satirical verses from the mid seventeenth through the eighteenth century. Sir Nicholas Gimcrack, the anti-hero of Shadwell's comedy, is an obvious parody of a respected experimentalist in the mold of Hooke.¹⁴ Gimcrack is occasionally explicit with his interlocutors about the fundamental inutility of his endeavors. Appearing in the opening scene miming swimming on a table while linked by a thread to a frog in a jar, he explains, "I content myself with the speculative part of swimming; I care not for the practice." Shadwell was among many seventeenth-century satirists to make sport of the Royal Society precisely by enumerating altered versions of their actual experiments, a technique Swift would adopt in *Gulliver's Travels* and *A Tale of a Tub*.

The vanities and inanities of the idle nobility are not essential components of the projector figure, however. When one of Gimcrack's daughters refers to one of his ideas as a "project," it is something ostensibly ludicrous but nonetheless premised on utility: a "Speaking Trumpet," or "Stentrophonical Tube" with which "a man may be heard round the County." As Gimcrack explains, "I have thought of this to do the King service; for when I have perfected it, there needs but one Parson to Preach to a whole County," while "idle" parsons will be free to take up manufacturing and thus be put to better use.¹⁵ This invention, which Shadwell's supporting characters scoff at, prefigures not only today's culture of mega-preachers, but the notion of live mass media and mechanized labor. The joke at the expense of both kings and clergy is evident, but it is more ambiguous whether the joke on Gimcrack is that he cannot make such an object or that such an object would have no good use.¹⁶ In addition to this proto-

microphone, Gimcrack proposes blood transfusion, lunar travel, calculating the weight of air, and studying small insects and micro-organisms.¹⁷ These propositions, all versions or slight perversions of Royal Society projects (for instance Gimcrack's theory that a man having received the blood of a sheep will grow a tail), are all laughable in context, but it is Shadwell's straight characters who echo today's luddites.¹⁸ This historical irony, far from neutralizing the philosophy of anti-projection, highlights how such criticisms do not admit extended time tables or loose interpretations of ideas. The critique is leveled from a perspective of immediacy, so that when it is plain to see that no result is to be had, the thing is not worth pursuing. Self-regarding experimental scientists, decadently unprincipled or otherwise, are themselves only one relatively minor species of projector. The sort capable of drawing the most public ire, by consequence of having more potential to waste public resources, is the projector as economic speculator.¹⁹ Phips is a version of this sort of projector, the profit-driven adventurer, but even more nefarious is the projector who would seek to enrich himself out of nothing. A projector character in Ben Jonson's *The Devil is an Asse* (1616) defines a projector as "one that projects wayes to enrich men, or to make 'hem great, by suites, by marriages, by vndertakings."²⁰ This definition might include the natural scientist or inventor, but places ambition at the core of the identity. Though he situates the advent of such a figure almost a century later than Jonson's satire (attributing an elevation in projection to the sequence of the great fire and sustained war with France), Defoe holds this enunciation of the projector as the one most worthy of protection and respect.

In the dedication of *An Essay Upon Projects*, Defoe refers to the "despicable title of Projector" before offering a speculative and sympathetic history of projects, and ultimately proposing several of his own, most notably a Penny Post and a national lottery to benefit charity hospitals.²¹ In advertising these projects, Defoe seeks both to be and not to be a projector, that is,

one who speculates about the success of future endeavors, but who does not do so cravenly, or against the public interest, or against too steep odds. In other words, he aims to be a successful and virtuous version of a thing known axiomatically to be failure-prone and mercenary. In Defoe's unimpeachable logic, projects, even those that fail, are necessarily defined by possibility, such that even those doomed by God's own hand, like the Tower of Babel, are susceptible to moral condemnation only for their risk-reward balance. Of that episode, Defoe concludes, "as in other projects, it only miscarried, or else it would have succeeded."²² *An Essay Upon Projects* captures the duality of projection as a concept, the rational and morally neutral germ and the undisciplined, reprehensible results. While Defoe engages more explicitly with after-the-fact assessment of the quality of projects, his analysis speaks to the historical bifurcation of the word. Where here it refers primarily to a financial undertaking, it also refers to the inescapable practice of thinking proleptically.²³

Though "projectors" are despicable, we all project, and every human development, from Noah's Ark to the Penny Post, can be conceived of as the fruit of projection. As Maximilian Novak suggests, even the choice of "essay" for the title of the work contains an implied argument. In aligning, if only appositionally, the concepts of essay and project, Defoe conjures the spirit of Montaignean "essai," a loosely formulated and undirected attempt, to lend projects an air of modesty and refinement.²⁴ But if Defoe's intent in *An Essay* is ambiguate and thus reclaim the word "project," the work's publication history undermines him. The work first appeared in 1697 as *An Essay Upon Projects*; in the following five years, Defoe's own brickworks project would fail and he would face the stockades for *The Shortest Way with the Dissenters*, a sort of mock project. The work was reprinted in 1702 bearing the title *Essays Upon Several Subjects*, continuing *Effectual Ways for Advancing the Nation*, though containing only

the erstwhile singular essay. The text itself is unaltered with the exception of a few typographical corrections, and the page headings read “An Essay Upon Projects.” Part of the explanation is that the publisher Thomas Cockerill had moved his house, and perhaps used the opportunity to add new titles to his catalog. But it is also likely that Cockerill, who had published several pieces attacking Defoe and *The Shortest Way*, understood both the author and the subject matter of “projects” to be toxic. What remains is projection without the despicable title, the very sort of exercise in rebranding that only a projector could understand.

Part of the work Defoe performs to legitimize projects in the *Essay* involves levelling diverse intellectual activities that may not intuitively be understood as projects, thus playing upon the internal diversity of projecting to separate the bad sort of projector from the essence of the practice.²⁵ After reciting a history of projects that bridges the early days of mankind and the present, Defoe’s essay offers a broad description (if not a definition) of projects, but remains fundamentally ambiguous about the relationship of projects and projectors. A projector, for Defoe, is commonly understood (and reviled) as one who undertakes a project, but may also be understood as one who conceives, however loosely, of some possible development. His history apposes two founding members of the Royal Society, Prince Rupert and John Wilkins, the former, for his numerous (if overstated) achievements in practical engineering, especially gunsmithery and metallurgy, “gave great encouragement to that part of [projecting] that respects engines and mechanical motions,” while the latter “added as much of the theory to it as writing a book could do.”²⁶ The book in question is *Mathematical Magick*, a work that contains explanations of known technologies, but whose cultural endurance, as Defoe illustrates, derives more from its sections speculating on possible achievements, most notably flight. There are several intriguing points of connection between *An Essay* and *Mathematical Magick*. Both, for

instance, cite progress in the design and efficacy of siege engines as a harbinger of an as-yet unrealized technological revolution, and both use the term “miscarry” to describe unsuccessful endeavors, in Wilkins’s case, the “easie” but never performed act of flight. Their arguments in favor of orienting intellectual pursuit towards radical innovation are premised on a simultaneous insistence that these pursuits would be in line with historical canons of wisdom (that useful objects and ideas are being continually developed without backlash), and that future phenomena cannot be adequately assessed according to existing historical data.

As I argued in chapter one, *Mathematical Magick* is a significant document in the history of English science not only for the insights it contains, but also for how it integrates fictions, such as Godwin’s *The Man in the Moone*, into its considerations of the probable, and consequently for its influence on later fictions, especially Defoe’s own moon voyage farce, *The Consolidator*, and, of course, *Gulliver’s Travels*. Fiction and projection thus draw inspiration from one another, and are practically united in utopian narratives. Through Wilkins, manifestly fictional narrative is incorporated into a “theory” whose value lies in its transcendence of empirical fact. While Defoe is ostensibly expressing a distinction between actual developments, or at least “encouragement” for them, and “theory,” his effect is unmistakably to level the two. For his part, Defoe attributes the “age of projection” not to any advances in knowledge, but to sustained war with France, which has fomented, for the merchant class especially, a perpetual condition of necessity, which is the general source of projection.²⁷ In placing Wilkins alongside Prince Rupert (to say nothing of the biblical Noah), Defoe lays down a defense of projects at the existential level, according to the premise that there are no projects that absolutely cannot, or should not be attempted, only those that have poor risk reward balances and those that happen to have not yet been realized.

The Academy of Lagado and the Order of Nature

Defoe's circumlocutory essay, and even his later, more explicitly critical portrayals of projection in the *Review*,²⁸ are illustrative not only of Defoe's shaky political commitments or contingent financial interests, but also of the illusory quality of projection itself. The heterogeneous fecundity of projection is ignored in simple condemnation, and was not lost on Swift. Both *An Essay Upon Projects* and *Gulliver's Travels* make light of the projector's central irony, that he is motivated by a necessity (either real or imagined) but is likely to become superfluous and wasteful. Swift's satire, in criticizing the character of the projector but dispersing its meditations on projection generally, vindicates projection as something at worst inevitable and at best necessary. Every project underway in the Academy of Lagado is, as yet, unsuccessful, appears to flaunt common sense, and, most damningly, endeavors to provide a solution to something that either is not or ought not be a problem. These projects include mowing fields using pigs, making silk from cobwebs, harvesting sunlight from cucumbers, and, most objectionably, recovering the original food from excrement. Eighteenth-century readers recognized in the episode the already mounting disappointment that the irresistible sense of possibility inaugurated by Bacon, Wilkins, and the early Royal Society had materialized into very little.

Since Marjorie Nicolson's and Nora Mohler's pioneering work establishing the referentiality of Part III, the figure of the projector has gradually come into view from within the larger context of "the new science."²⁹ Swift was not opposed to scientific progress tout court; rather, projectors, we now understand, are, in Swift's view, the illegitimate children of responsible science.³⁰ They mistake the absence of simple logic for superior insight, they are

certain of success when failure seems obvious, they are corrupted by monomania, and most important, they drain resources that would be better allocated elsewhere. Though Swift's projectors are guilty of all of the above, I understand *Gulliver's Travels* as a whole to be a defense of projects along the lines of Defoe's. The grounds of this reading are as follows: 1) The projects underway in Lagado, though not at all probable across the board, can be placed within a spectrum of probability that extends well beyond zero, 2) The text of *Gulliver's Travels* itself is explicitly tied to an aborted project on the part of the assumed author, 3) projection appears throughout the work with varied significance, and 4) Swift's evocations of projects in *Gulliver's Travels* and *A Tale of a Tub* belong to a deeper critique of natural philosophical systems, which are both more pervasive and more insidious than the speculations of projectors. The explicitness of projects that renders them so open to satire is what renders them forgivable and redeemable; what Swift seems more concerned by is projection's other, a posture of natural philosophical purity that uses the rhetoric of system to both organize the domain of the factual and delineate the boundaries of reasonable speculation.

Defoe's inclusive, amorphous view of projection provides an important intertext with Part III of *Gulliver's Travels* because Swift's projectors have been all too easily dismissed in hierarchical, absolutist terms. What fewer critics have done is read Swift's projectors as wasteful pursuers of potentially useful innovations that are improbable but not impossible, or as local rather than categorical failures. The most striking features of Lagado, the metropolis of Balnibarbi, over which the island of Laputa menacingly floats, is that its soil is "unhappily cultivated." Travelling under the guidance of the former governor Munodi, whose reasonable character earns him condescension from the Laputan king and distrust from his countrymen, Gulliver instantly notices the miserable condition of the Lagadans, which is the result not of any

natural or artificial calamity, but of an absence of “good effects” from their “unaccountable” labor.³¹ Utility is thus the central axis of Swift’s satire in this section, where the comedy of every succeeding scenario derives from either the visible inutility of a proposition or an imbalance of labor and effect. “Waste” is a term central to the articulation of this critique. In addition to the country, which generally “lies in waste,” the academy itself consists of annexed buildings lining a street deemed to be “growing waste,”³² which is to say, unproductive or idle by the standards of the new tenants, but also hinted to be currently in the process of producing more waste. In Lagado, once useful soil is squandered, the resulting waste begets waste in all senses of the word. But waste, of course, is an artificial, indeed cultural, determination, so that both the wastefulness of Lagado, and its projectors’ interest in various forms of waste, invite scrutiny of the determination thereof.³³

In Gulliver’s passage through the technological wing of the academy’s estimated five hundred rooms, he encounters projectors who, in order, are attempting to: 1) extract sun-beams out of cucumbers, 2) reduce human excrement to its original food, 3) calcine ice into gunpowder, 4) build houses beginning with the roof, 5) mix new pigments (this particular projector is blind), 6) use hogs to plow fields, 7) make naturally dyed silk from spider webs, 8) affix a sun dial to a weathervane, 9) use bellows inserted into the anus of (canine) trial patients to cure disease. From these deliberately brief abstracts I have omitted Gulliver’s descriptions of the projectors and their apartments, his opinion of them, and his statements assessing their merit, which I discuss below, and which convey the implied rhetoric of the projectors themselves. In their crude outline, in what we might call a casual assessment, projects 3, 5 and 8 are truly nonsensical, 4 and 9 almost so, but their nonsensicalness is established by experience, which is to say custom, and thus these projects retain a degree of experimental worthiness. Projects 1, 2, 6, and 7, however, run the

spectrum from ridiculous but not unimaginable to just below reasonable; they are improbable, but by the standards of contemporary science possible.

The first two projects seem to have an explicit logic so clearly flawed that the satire is self-explanatory: projectors are alternately wasting food and trying to make waste back into food. As Douglas Patey argues, “in seeking to reverse the order of nature (extracting sunshine from cucumbers, returning excrement to its original food), Lagadan projects are utopian—the external equivalent, we might say, of the failure to know one's self.”³⁵ Patey is undeniably correct, but also relying on a questionable understanding of “the order of nature” in relation to man's understanding of itself. It is a cultural determination that makes excrement the opposite of food; humans do not eat excrement, but they could, and indeed there are many coprophagic animals, including mammals, and as Swift might have conjectured, man himself in some earlier stage. Excrement, according to a strictly logical assessment, is a potential source of sustenance. Of course, this projector is not actually proposing a shift in human culture in the interest of an uncomfortable but potentially efficient proposition. Rather, he is undertaking a project to take food, in the “human” sense, *out* of excrement. He does not mean to counter the order of nature, but precisely to maintain the artificial terms with which this order has been laid out while testing a potential resource. His project thus does not go far enough to be useful, as he proposes something less akin to recycling waste than foraging for the original food, now both befouled and diminished.³⁶

The case is similar for the projector aiming to harness sunlight from cucumbers, who seems to be ignorant of the logic of nature, wherein sunlight takes part in the production of vegetables, and not the other way around. We know this project to be ridiculous because it is so explicitly invested in this reversal. And yet, phrased otherwise, the idea may not seem entirely

unsound, as its core is the proposition that the solar energy stored in vegetables might be harvested in a manner other than eating them, by considering cucumbers as batteries rather than just food. Though this premise gives rise to numerous and perhaps insurmountable challenges, a concept equivalent to today's production and use of "biofuel" is not without a scrap of probability. If we substitute "sunlight" for "energy," and treat the exercise more as research and development than as a strict business model, this projector would be well within the confines of responsible academia or commercial development. Of course, had this projector been so modest in his conjectures and flexible in his approach, he would not be a projector.

Here I have done some editorial labor to distill the essence of these two projects from their broadly satiric description in the text. It is, to some degree, a perverse exercise, akin to finding food in excrement, to look for evidence of reason from characters and scenarios that so clearly signify otherwise. There is, however, a tradition, nearing a century old, of finding the rudiments of proper science in Swift's projectors. The sun-beam project is one of several modelled on an experiment either performed by or reported on by the Royal Society. In addition to mirroring Shadwell's Gimcrack, who conceives of selling bottled country air to cities, Swift's sun-beam projector also references Stephen Hales (a name Swift may or may not have actually known) who, in 1725, read at the Royal Society sections of his manuscript, *Vegetable Staticks*, which put forth what we may now recognize as an early theory of photosynthetic nourishment.³⁷ The project enunciated to Gulliver is thus a combination of Gimcrack's commercial bottling operation and Hales's responsible scientific conjectures. The satire is less a presentation of the frivolities of the Royal Society than a composite of traditional points of caricature appended to an idea about which Swift may well have been agnostic. It is obvious that the projectors lack virtue and reason, but perhaps not simply because that is the nature of projects.

Among more high profile readers of *Gulliver's Travels*, George Orwell criticizes Swift's satire for ignoring the possibility that experiments lacking immediate practical application could prove useful in the future. By contrast, Howard Gest, the biologist and historian of science who researched the Hales connection for a 1988 article in *Photosynthesis Research*, notes that the burning of wood and coal essentially consists of utilizing the energy created by photosynthesis and stored in the form of organic matter.³⁸ One cannot know whether Swift's own understanding of vegetable biology might have allowed him to understand the process of extracting heat as akin to capturing sun-beams, but if he had accessed the minutes of Hales's presentation, it is more likely that he found the language amusing than that he found the research nonsensical, and thus the probability of each project need not be entirely discounted. To this end, Isaac Asimov's *Annotated Gulliver's Travels* serves as a fruitful illustration of the possibilities of reading the projectors outside of the demands of historicism. His note for "projector" reads:

A project is some scheme or design of varying degrees of likelihood. If the scheme is a hare-brained or a dishonest one, a projector is a promoter or a con-man... We could suppose that to Gulliver, the word projector would here be used to describe an honest piece of research (however disappointing the results might be), and a "projector" would then be what we call today an "inventor" or a "research scientist."

The projectors described in this chapter, however, are harebrained lunatics... Apparently Swift made use of some of the researches actually proposed or in progress at the Royal Society. I can well believe it. It is always possible to go down the list of research projects at any university or institution and come up with a collection of titles that sound hilarious. By appropriate exaggeration and a careful omission of all the necessary explanations... any somber scientist can be made to sound like a crackpot.³⁹

Well versed in the history of ideas, but less so in the culture of eighteenth-century science, Asimov intuitively grasps what is, for Defoe, a feat of rhetoric: that the man who presents as a con-man or lunatic may actually be a somber scientist whose purpose is simply lacking proper advertising. Proceeding in this approach, Asimov is able to find the rudiments of proper and/or useful discovery in every one of the Lagadan academy's projects, first by glossing what he recognizes as Swift's joke, then offering a redemptive possibility prefaced by "And yet..." In reference to

the projectors who would “calcine ice” and harness the “malleability of fire,” Asimov offers nuclear physics as a fulfillment of these notions. Radioactive metals are a kind of “malleable fire,” while deuterium, a hydrogen isotope used in nuclear weapons that is extractable from water, may in this process be considered akin to gun-powder extracted from ice. The former, Asimov remarks, is beyond “anything Swift knew or could imagine,” but the latter raises the question of whether the Lagadan projector could have had “some inkling.”⁴⁰ While it is certainly the case that Asimov is overestimating Swift’s scientific curiosity and enthusiasm for novelty, as a fiction writer and witness to a supposed age of projects, Swift understood probability to be a fluid notion, and would not have aligned the categories of the fictional and the improbable (or impossible) automatically. More within the bounds of historical possibility, Asimov notes that the eating of excrement is, in a way, undertaken “in China,” where human waste fertilizes vegetables (though he continues with a conjecture about future space travel missions requiring means of recycling human waste, an operation for which this projector might be credited as a pioneer). On the matter of the cucumbers, he makes the same rationalization as Gest, premised on a substitution of “energy” for “Sun-beams.”

Even an ahistorical consideration of *Gulliver’s Travels* as a work equivalent to the science fiction of later centuries must understand the scientific achievements that supervene Swift’s writing to be irrelevant to Swift’s satire. More at issue is the degree of probability Swift recognized within the hare-brained projects that are ultimately enunciated. Where, between the core (the idea or set of ideas that the project would seek to exploit) and the surface of the project (its enunciation and implementation), does extracting sun-beams from cucumbers become absurd? In addressing this question I discount the possibility that the absurdity extends all the way down, from the “lunatic” surface to the “research scientist” core, a possibility that Swift

occasionally seems to suggest.⁴¹ But, as I will argue later in this chapter, if we attribute all possible skepticism to Swift, scientific research remains more benign than illicit, for the knowledge it yields is redundant and necessarily incomplete. If, for instance, Swift was directly or indirectly acquainted with Hales's 1725 readings before the Royal Society and conceived of the cucumber project from them, he would have heard accounts of the relative growth rates of stems and leaves, and perhaps some speculations about one of the central tenets of agriculture, that plants draw nourishment from sunlight. The experiments of Shadwell's Gimcrack, for comparison, were immediately understood to reference the work of Hooke. More properly, however, they present what Coppola calls a *reductio ad absurdum* of Hooke's experimental rhetoric. Hales, though he could be generously called an early theorist of photosynthesis, and would ultimately be translated by Buffon, was far too modest to be the subject of such satire, and his inquiries into plant life amount to a belaboring of the obvious. Instead, Swift's critique, insofar as research into cucumbers may be considered its "target," is not of the thing itself, but rather its potential for corruption.

In presenting a set of projects that largely fall below the level of immediate absurdity set by Shadwell, Swift would seem to understand not only a difference between research and projection, but projection itself as a practice that is not inherently, but only incidentally flawed. Aside from the non-zero probability of the Lagadan projects, another key to Swift's complex relationship with projection can be inferred through Gulliver's sympathy to the practice. Prior to their tour, Gulliver has been "represented" to his guide by Munodi as a "great admirer of projects" both because of his "easy belief" and because, as he glosses, "I had myself been a sort of projector in my younger days."⁴² As we shall see below, Gulliver will be a projector again, and is to some degree a projector in the act of his narration, and it is not a stretch to imagine how

Gulliver might, in his itinerant career, have taken up projection. The line (which concludes the chapter preceding the Academy tour) acquires added resonance, however, because it seems to invite critical consideration of Swift's own projecting career. Most commentators cite the 1712 "A Proposal for Correcting, Improving and Ascertaining the English Tongue" as Swift's most earnest foray into projection, and an experiential source for his later satirical proposals. In a letter to the earl of Oxford following the submission of "A Proposal...," which called for an English equivalent of the Académie française, Swift referred to himself deprecatingly as a "projector" in a letter to Archbishop King.⁴³ That Swift would eventually create the Academy of Lagado or write *A Modest Proposal* has been taken as evidence of his perpetual embarrassment over his more youthful optimism.⁴⁴ But the autobiographical invocation of projection on the part of Swift's character is an irony more layered than a simple substitution of one thing for its opposite. As the converging biographies of Swift and Gulliver illustrate, Swift may very well have been of Defoe's camp on the matter of projection, and considered the source of his embarrassment to be the poor execution of his design, and not the simple fact that he attempted to bring about improvement through cultural engineering.

Balnibarbi, which is implied to have been spoiled by the practice of projection, at the same time fits Defoe's criterion for entering an age of projects. The island is, on one hand, perfectly arable and sustainable, but, even were it not suffering for the wastefulness of the Academy of Lagado, it remains on the disadvantaged side of a perpetual conflict. Unlike the land of the Houyhnhnms, or that island's utopian models, Balnibarbi has reasonable cause to innovate, especially concerning agriculture and energy production. It is perhaps not the practice of projection that is to blame so much as a corruption of its internal standards. In this consideration, Swift's attention to the character of the projector acquires added significance. The

only projector to whom sustained description is given, the sun-beam harvester, presents a concise portrait of corrupted good intentions. Unlike the excrement scummer, the sun-beam harvester does not bear the physical repugnancy of his work. His case is more akin to that of the blind pigment-maker in that his project suffers for *his* being the one to carry it out. As Gulliver reports, “He told me, he did not doubt, that, in eight years more, he should be able to supply the governor’s gardens with sunshine, at a reasonable rate,”⁴⁵ here offering a projection that is both comically assured and deceptively modest. He will require eight years of time and cucumbers to supply a presumably small portion of the island’s gardens with sunlight that, in all evidence, has not been insufficiently supplied by the sun itself. Gulliver continues in reported speech rather than his typical narration, “he complained that his stock was low, and entreated me ‘to give him something as an encouragement to ingenuity, especially since this had been a very dear season for cucumbers.’” Gulliver acquiesces, using money given to him by Munodi in case of “begging.” The fuel of the projector’s endeavor is understood to be not cucumbers--which have been insufficiently farmed to provide research materials, much less to become a significant energy source, but “encouragement” in the form of money that will enable the projector to remain estranged from both the economic and material consequences of his project. The projector turns one of the best arguments against his project, the scarcity of the resource he wishes to exploit, into an inducement for Gulliver to support his person.

Such cases bring to mind Defoe’s existential argument for projection, as the project’s merit is undermined by the character of the projector, and its failure can be known more by the modest profit margins of its ideal fulfilment than by the science of its premise. Assessing this episode, David Alff concludes that, if Swift’s satire must be considered as having a target, it is the rhetoric of projection that transubstantiates doubt into certainty, thus Swift instructs his

reader to “doubt doubtlessness.”⁴⁶ This reading, effectively a narrowing of Patey’s insights on Part III, accommodates Swift’s appreciation or at least toleration of scientific inquiry, including inquiry without a manifest utility, by isolating projection as a point of differentiation between ancient and modern conceptions of science. Patey, situating the Academy of Lagado episode within the context of Swift’s sustained commitment to the ancients, reads the projectors as enacting a characteristically modern substitution of science for art, where the former aspires to certainty through progressive development and the latter to probability through imitation. The problem with projection, then, is either that it is a perversion of science, or that it is a kind of evidence of science’s dominion becoming overextended.

In highlighting Swift’s intuitive critique of certainty from within his more extended and complex meditations on the possibility of certainty, both Alff and Patey separate what is manifestly deplorable about projectors from what is compellingly ambiguous about experimental practice. One possibility that seems neglected is that Swift’s skepticism extends beyond the particular rhetoric of projection to the domain of sober science, but in levelling the two does not amount to a condemnation of either. This possibility, at least as it pertains to *Gulliver’s Travels*, warrants consideration because the separation between projection and ideal science is only possible in a reading that treats Gulliver’s engagement with projectors as a single instance within an episodic structure of satire. We can read through Gulliver’s alternatively credulous and politely skeptical narration of Lagado in order to recognize a disparaging imitation at the rhetorical level, but this is only the most direct, extradiegetic source of meaning to be found. If Swift’s meditations on projection, science, and their relationship between them are considered as being dispersed across the whole of the work and between the content and frame of the narrative, the critique of projection indeed becomes inseparable from a critique of more limited, empirical

models of science, and this slippage precludes the possibility of a complete condemnation. If bad science, bad economics, and bad politics can all be called projecting, projecting must either be coextensive or in some way belong to these neutral and unproblematic disciplines.

Outside of Gulliver's visit to Lagado, the term project is used scarcely, but significantly. The first appearance of the term outside of the prefatory materials comes in Part I, as Gulliver tells the Lilliputian king of "a project I had formed of seizing the enemy's whole fleet." This project is of course a success, as Gulliver performs it almost exactly as conceived, and it accomplishes Lilliput's military ambitions and earns Gulliver personal accolades. It is, then, exactly the sort of project referred to by Defoe as being characteristic of England's martially inspired age of projects. In bringing the project to fruition, Gulliver collects necessary data, consults with experts ("the most experienced seamen"), and commissions special equipment before executing the plan with physical dexterity. If this episode can be said to contain any critique of projects, it is enmeshed with the flawed character of the Lilliputian state, in this case, that they live in a state of sustained conflict for arbitrary reasons. Later in Part I, Gulliver refers to two more aborted projects, one on the part of Lilliputian ministers to starve him to death, and his own project to pelt the city with stones in revenge of his treatment. Indeed, outside of the specifically scientific projecting of Part III, "projects" in *Gulliver's Travels* are nearly synonymous with individual or partisan intentions, and are carried out or abandoned largely owing to quotients of physical or political capability. In Part II, the Queen of Brobdingnag carries out her project to build Gulliver a cistern for rowing and sailing, while Gulliver cannot "form any project with the least hope of succeeding" in order to gain his liberty. Before Gulliver reaches the Academy of Projectors, projects are as diffuse as they are in Defoe's essay, referring to any idea for a potential object or state of affairs.

Arguably the strongest critique of projects—by Defoe’s (non)definition—in the work occurs without the term actually appearing. Framed ironically as a demonstration of the Brobdingnagian king’s “confined education” and “narrowness of thinking,” Gulliver is rebuked by the monarch for his offer to fabricate gunpowder and thus give him “absolute” command. The king insults Gulliver not for offering something unnecessary but rather “inhuman,” and in his gloss of the event, Gulliver links the king’s rejection to the Brobdingnagians’ “not having hitherto reduced politics into a science” and instead preferring “common sense and reason” to politics in the European sense. These arguments would align cleanly with the simple anti-projection critics have recognized in Part III were it not for the king’s insistence that his rejection and disgust are not the result of a general conservatism. He insists that “few things delighted him so much as new discoveries in art or in nature,” and follows up this claim with an intriguingly specific counterfactual, that he would support “whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before.”⁴⁷ The king’s stated ideals are both humanistic and commonsensical, but this final proposition—indeed a project—presents a challenge to Swift critics who would take his anti-projection stance to be part of a general aversion to experimenting with nature. As Gulliver claims, the Brobdingnagians apply the study of mathematics to agricultural and mechanical improvement, much as the Lagadans attempt to. The superiority of the former is underlined in the matched phrasing of Part III, wherein Gulliver “could not discover one Ear of Corn, or Blade of Grass” in certain spots of that island. The difference between extracting sunbeams from vegetables and growing twice as many in the same space (perhaps by breeding for particular characteristics) may intuitively sound like the difference between nonsense and sense, but there is no way to know, according to a properly skeptical epistemology, whether both are not outside the order of nature.⁴⁸ If the king of

Broddingnag is a reliable voice of prudence, projection is a logical application of learning, and its practice is a matter of utilitarian morality, that is, producing good or ill effects. The question then is whether such moral determinations, or accurate foreknowledge, are within the capabilities of humans.

After Part III, the term “project” appears exactly once, in Gulliver’s translation from Houyhnhnm language, in reference to a habit of the Yahoos. Groups of Yahoos regularly attempt violent ambushes, “But,” as Gulliver’s master explains, “if they find their project has miscarried, they return home, and, for want of enemies, engage in what I call a civil war among themselves.” This example of a project, a lexical choice on the part of Gulliver, invokes both inutility and amorality. The term’s appearance acquires additional significance because the Houyhnhnms are the only society with which Gulliver has sustained contact to whom Gulliver does not attribute a single project.

The Disavowal of Projects in Houyhnhnmland

Part IV’s Land of the Houyhnhnms stands alone as the narrative’s first non-humanoid civilization. Its utopian features, however, are recognizable as perfectly antidotal to Lagado’s projection-driven dystopia. The Houyhnhnms’ social and technological practices are dictated not by a commitment to progress and innovation but by a maintenance of physical and political health. In contrast to Lagadans, the Houyhnhnms only engage in useful labor, and know very little scarcity, which, when it does arise, is treated by a simple reallocation of resources. Still, the absence of projection among the Houyhnhnms is a relatively narrow avenue to pursue given the stakes of Part IV within *Gulliver’s Travels*, its potency as an autonomous *conte philosophique*, and its enduring status within studies of the Enlightenment. If projection necessarily involves

novelty and movement in time, the absence of projection is one among many implications of the Houyhnhnms' utopian timelessness, what Lévi-Strauss would call "the characteristic feature of the savage mind."⁴⁹ Whether the Houyhnhnms' sense of time is considered through a religious⁵⁰, historical, allegorical, or experimental (or any combination thereof) paradigm⁵¹, it is defined by equilibrium. They possess a quasi-mythical sense of an epoch before Houyhnhnm and Yahoo relations solidified into the state in which Gulliver encounters them, but there is no sense among the Houyhnhnms or in Gulliver's narration that they are accustomed to macrotemporal or generational change, whether improvement or decay. In relation to the Houyhnhnms, Gulliver may be considered as an illustration of the late effects of the fall of man, or of the corrupting potential of cosmopolitanism—in other words, the catalysts of projection specified by Defoe—but his threat to the Houyhnhnms is bound to his capacity and assumed natural inclination to possess ambition and enact change.

Diegetically, Gulliver does not acknowledge the irreconcilable difference between him and his hosts to be anything other than a deficit of morality, collapsing his contingent experiences and worldly knowledge into an existential condition. Accustomed to think of sequential changes in terms possibilities and probabilities, Gulliver is convinced that he lacks a necessary virtue. This slippage occurs in the text largely around the Houyhnhnm use of the (translated) phrase "the thing that/which is/was not," which Gulliver glosses as the construction they have in lieu of a proper term for lying. As Gulliver's master Houyhnhnm explains, however, the phrase refers to a statement that contradicts something known empirically, but does not carry the implication of willful misrepresentation, and implies a delineation between actual and possible facts. In the course of Part IV, the phrase is most commonly employed in reference to Gulliver's testimony about concepts for which the Houyhnhnms have no reference point. It is

applied, theoretically, to statements that empirically contradict a known truth, but in Gulliver's experience it is only ever applied to statements that refer to things not empirically known. The country of the Houyhnhnms is touted by its inhabitants and Gulliver as being free of the vice of lying, but is more properly devoid of the language for abstract, proleptic, counterfactual, or possibilistic thought.

The Houyhnhnms complement not only the perpetually projecting Lagadans, but also the Laputans, whose physical functionality is compromised by their indulgence in abstract thought and their irrational fear of the sun's destruction. In Kareem's assessment, the work as a whole is "a cautionary tale about the destructive effects of such radical estrangement from one's own habitual beliefs." Reading Swift between Locke's remarks on probability in *An Essay Concerning Human Understanding* and Hume's radical extension of the category of the probable in *An Enquiry Concerning Human Nature*, Kareem, turning to Part IV, concludes that "*Gulliver's Travels* cultivates a mental suppleness distinct from the inflexibility of both Yahoos and Houyhnhnm."⁵² Indeed, the virtue of the Houyhnhnms is bound to this inflexibility. Their sense of universal reason forbids them to disagree with one another, so that civil matters are adjudicated by "*hnhloayn*" which Gulliver translates as "exhortation," and which are indisputable "because no person can disobey reason, without giving up his claim to be a rational creature."⁵³ It is a *hnhloayn* that expels Gulliver from the island as a threat to Houyhnhnm kind; his acceptance of this sentence "as a rational creature" (guilelessly) ironizes the reasoning of its authors.

Gulliver's account is written in the aftermath of this decision, and, as Gulliver indicates in the prefatory letter to his cousin Sympson, its composition is related to a project to make Yahoos imitate Houyhnhnms. This project is an impossibility by external standards because it

defies the ontological difference between two species, and it is recognized as an impossibility by Gulliver for the same reason, but with some added moral explanation. Prior to mentioning the project explicitly, Gulliver defends the historicity of his account on the grounds that his two years among the Houyhnhnms have cured him of the Yahoo habit of lying. He then claims that he would not have attempted the “absurd” project had “corruptions of his Yahoo nature” not been revived by contact with his family. He is, then, innocent of the yahoo vice of lying but guilty of the yahoo vice of bad projection. The circularity of this predicament—that Gulliver recognizes that attempting to become a Houyhnhnm is a yahoo delusion—is the dark payoff of Swift’s fable, but in putting projection at the crux of Gulliver’s self-criticism, Swift invites an evaluation of Gulliver’s complete dismissal of the practice. While Gulliver clearly believes that projection is anathema to the Houyhnhnms, it is possible that the association of projecting with lying, and its distinction from proper rationality are Gulliver’s own inventions.

The Houyhnhnms are not without their own “mental suppleness.” The inflexibility of both Yahoo and Houyhnhnm is made apparent to the reader of Gulliver’s work, but these inflexibilities are of different natures and degrees, and the work is of course the product of a convert who is susceptible to confirmation bias. In brief, Gulliver’s banishment is decided upon at the quadrennial assembly, during which the Houyhnhnms resume “the only debate that ever happened in their country... ‘whether the *Yahoos* should be exterminated from the face of the earth?’”⁵⁴ At this assembly the Houyhnhnms put together a speculative history of the Yahoos’ presence on the island, and though Gulliver’s master relays Gulliver’s own suggestion that Yahoos be castrated rather than exterminated, the assembly nevertheless concludes that Gulliver is a threat to lead a Yahoo revolt, and thus either must be cast out to live among the common Yahoos or swim back to whence he came. This result is intriguing for two reasons. First, the

consensus that Gulliver is a threat is premised on an intimation of future events, and second, Gulliver's master informs him of the hnhloayn (of which he, and not Gulliver, is the addressee) after the fact and admits to Gulliver that, "for his own part," he "could have been content" to keep Gulliver in his service as a being "capable to imitate the Houyhnhnms."⁵⁵ Not only does Gulliver's master treat the supposedly inviolable order with some flexibility, he readily admits to possessing an opinion and expresses it in the form of a counterfactual future. One only needs to be a little more flexible in language than Gulliver allows in his translation to recognize the Houyhnhnms' vision of a Yahoo-free island as a project. Yet for Gulliver, this does not register as a project because it is what Defoe identifies as an ideal project; it offers manifest advantages for the nation and its accomplishment is probable. In Gulliver's understanding, the Houyhnhnms would only be doing what is proper to their species; he accepts their practice of political economy as natural law.

To identify the Houyhnhnms as projectors does nothing to dismantle the utopia or to intuit its failure, but rather highlights an overzealous commitment to the perceived order of nature as an aspect of Gulliver's conversion. It is not easy, or perhaps even worthwhile to track Gulliver's attitudes on the topic of projection across the work. His grotesque descriptions of human warfare to incriminate his fellow humans to his master Houyhnhnm in Part IV evidences an internalization of the king of Brobdingnag's criticisms⁵⁶, but his commentary throughout the work rarely reflects his conversion on the matter of projection (for instance, there is no evidence that his commentary on the Brobdingnagians or the Academy of Projectors is Houyhnhnm influenced). Ultimately, projection is evoked across *Gulliver's Travels* as it is evoked in seventeenth- and eighteenth-century culture generally, that is, it is mostly wielded to signify a critical position, but retains a pliability of meaning that complicates this position. It may be

purely accidental that the destruction of the Blefuscudian fleet, and, for that matter, Gulliver's considered destruction of the Lilliputian capital, are identified as projects, while the genocide of the Yahoos is not, but this usage is consistent with Defoe's implication that the term can be applied arbitrarily, and that its negative connotations can be easily undone by applying the title more widely. In drawing a line between the Houyhnhnms and himself on the matter of projection, Gulliver is not echoing Swift's aversion to the practice, but rather expressing the naivete of the uninterrogated distinction between rational or useful proleptic thinking and despicable projects.

Up to this point my analysis of Gulliver's visit to Lagado has been limited to his tour of the (undesignated) first wing of the Academy of Projectors, whose projectors warrant laughter because their projects are generally improbable in a physical or material sense. The other half of the Academy houses "projectors in speculative learning," whose referent is not the practice of experiment in Swift's time, but the institutionalization of thought. Terry Castle holds up one of these speculative projects, an automatic writing machine, as an emblem of the modern intellectual atmosphere that the Houyhnhnms transcend.⁵⁷ Two more language-oriented projects, the reduction of all language to nouns and the replacement of speech with a portable deck of images, do, however, prefigure elements of Houyhnhnm communication, namely its emphasis on utility and difficulty with subtle distinctions (for instance, humans and yahoos).⁵⁸ Some of the projectors of speculative learning are akin to the "conventional" projectors, who desire to bring new objects or practices into the world, but others, like the aforementioned, are interested in engineering the mediation of knowledge. This more diffuse form of projection encompasses what we might call the ideological component of the New Science. Swift's bifurcation of the projecting academy reflects the two potentially contradictory ends of natural philosophy under

the direction of the Royal Society: to explore and cultivate novelties and to codify knowledge into efficient and self-contained systems. The former ambition, as we have seen, warrants criticism for being wasteful to the degree that it is fanciful, but it is the latter that, in Swift's view, more pervasively hinders the achievement of an ideal culture of science.

Across Swift's corpus, less scorn is directed at projectors than "systems" and the systematicians who devise and espouse them. Later in Part III, for instance, when Gulliver converses with the shade of Aristotle, the philosopher offers a commentary that has largely been read as reflecting Swift's own: "He said, 'that new systems of nature were but new fashions, which would vary in every age; and even those, who pretend to demonstrate them from mathematical principles, would flourish but a short period of time, and be out of vogue when that was determined.'"⁷² Aristotle responds directly to the shades of Gassendi and Descartes, dismissing their atomistic and vortical models, respectively. He predicts the same for their ouster, the doctrine of "attraction," which refers at once to the principle of universal gravitation outlined in Newton's *Principia*, but more properly to the ascension of Newtonian physics as a signifier of coherent and complete knowledge. Because Newton is not explicitly referenced (or, for that matter, summoned by Gulliver), Swift may also be invoking attraction specifically because of its historical potency for systematical rhetoric. Twenty years before the publication of the *Principia*, Hooke delivered a lecture on gravity to the Royal Society that promised "a system of the world very different from any yet received."⁷³ Swift's Aristotle does not need to deny the truth of physical attraction, or calculus, or atoms, in order to discern their failure as skeleton keys for "the world" or "nature." What is irksome about systems, aside from the fact that they are liable to be wrong, is that they subjugate the things they mean to make intelligible to their own flawed design.

Swift's most sustained critique of systems is contained within *A Tale of A Tub*, which Frank Boyle and more recently, Jess Keiser, have identified as satirizing the rhetoric of the *Principia*. In Boyle's reading, Swift's critique of Newton centers on the natural philosopher's reliance on a loose concept of "vapours," that, when taken up by Swift's hack narrator, offers an avenue for the merger of modern corpuscular philosophy and the occultism it supposedly banishes.⁷⁴ Keiser further suggests that *A Tale's* critique of systems draws from attacks on Hobbist materialism for its broad application of a few concepts to explain apparently dissimilar phenomena. As Keiser summarizes this position: "thanks to the moderns' reductions, difference and divergence are made to conform to predefined patterns, while moments of particularity are readily digested and homogenized into an overarching scheme."⁷⁵ The comfort of under-reading appears as a motif in several of Swift's works, from the Lagadan projector who would co-opt the doctrine of transubstantiation to have his students digest philosophy as wafers, or the speaker of *A Tale*, who extolls the modern method of learning by reading indexes, which "govern" texts "like Fishes by the Tail."⁷⁶ It does not require much of a stretch to see the Houyhnhnms as "modern" in this respect, for their application of terms such as "Yahoo" and (in translation) "reason" constrain the world to their few axiomatic ideas. Things that contain some reason or resemble Yahoos are assimilated into a system that has no use for their subtle distinctions; the ontology of things is made to correspond to their appearance to Houyhnhnm perception.

When systems fail to be comprehensive, either violence or nonsense must occur. As an illustration of this point in Swift's corpus, Patey directs readers to Brobdingnagians' label for Gulliver, which, as Gulliver reports, corresponds exactly to "*lusus naturæ*"; a determination exactly agreeable to the modern philosophy of Europe, whose professors, disdaining the old evasion of occult causes, whereby the followers of Aristotle endeavoured in vain to disguise their

ignorance, have invented this wonderful solution of all difficulties, to the unspeakable advancement of human knowledge.”⁷⁷ Patey idiomatically glosses the label to mean “a monster,” or “freak of nature” in the sense that Gulliver uses it according to its application as a catch-all for the gaps in incomplete systematic knowledge. But as Swift’s readers were likely aware, “*lusus*” literally translates as “sport,” and in the classical texts from which it is borrowed, most notably Pliny’s *Natural History*, it is employed not to isolate mysterious or irregular phenomena, but to highlight their captivating qualities.⁷⁸ Though upon careful reading, the above passage appears as an ironic championing of the moderns in the voice of Gulliver, it hardly has the effect of affirming the wisdom of the ancients, rather, it deliberately ambiguates the supposed strategies of each. Gulliver rehearses credulously the empty rhetoric whereby the moderns claim mastery over nature through fiat terminology, and in doing so reminds his reader of the pliability both of signifier and signified.

Though future-oriented, probabilistic considerations often appear at odds with responsible empiricism and, indeed, common sense, in his fiction, Swift does not take issue with probability. Boyle suggest a way out of this seeming opposition by considering Renaissance humanism as an absent third element across Swift’s satires. This possibility is grounded in Stephen Toulmin’s argument that the New Science has been persistently mischaracterized as being in competition with the wisdom of the ancients, when it is more immediately a reaction to humanism.⁷⁹ In the same vein, Patey argues that the “familiar posture of the new scientists in rejecting previous authorities was less often an attempt to clear away past errors in order to make room for a new probabilistic experimental science than to clear away the probabilism of Renaissance humanists in order to make room for a new philosophic and scientific certainty.”⁸⁰ In these accounts, overvaluation of certainty, at the expense of probability, is a flaw of both

ancient and modern learning. While the Lagadans demonstrate the folly of substituting certainty for probability rhetorically, the cases of the Laputans and the Houyhnhnms call to mind different approaches to the Pascalian wager, wherein probability must be given primacy over certain facts, as the risk of not doing so (ideally) outweighs the comfort of limiting knowledge to pure empiricism.

Fiction, Induction, and Common Sense

The most logical defense of the Houyhnhnms' decision to banish Gulliver is that the maintenance of their habitual conditions is the guarantor of their social order. Their reasoning is explicitly modal, that "it was to be feared" that Gulliver's Yahoo nature would eventually emerge and subvert them. Unlike the fear of the Laputans that the sun will expire, this fear is premised on some observation and Gulliver's testimony, but it is nonetheless questioned by Gulliver's master. The Laputans of Book III losing sleep over the expiration of the sun, or discussing it with one another daily is absurd because they have never observed the sun's behavior to change, but, though it would be a less extreme leap in logic, neither have the Houyhnhnms seen Gulliver be anything but suppliant. The Laputans thus illuminate a feature of mathematical probability that humans, for Swift, may not be equipped to handle, that outside of strict logical impossibilities, it is theoretically possible that anything can happen at any time. By this reasoning, a catastrophe that may occur at any moment is a significant aspect of Laputan experience. This attitude is essentially a *reductio ad absurdum* of how Crusoe learns to think about probability, that no amount of experience can abolish the possibility of any given occurrence. Though Gulliver is made to believe the Houyhnhnms hold no arguments, or perhaps do not even speak of things of which they are not certain, it seems to be the case that their

exercise of reason includes the weighing of probabilities, consisting of both qualitative and quantitative aspects. The potential existential threat that Gulliver poses thus makes any chance of its occurrence significant. They are not certain this will happen, but they are somewhere between mostly and uniformly certain of the risk reward balance. It is their ability to envision scenarios rather than simply calculate them that squares their reason with experience, and frees them from the abyss of rational skepticism that Swift seems to intuit in his sketching of the overly experimental Laputans and which would later be formalized by David Hume.

Hume's landmark critique of induction in his *Treatise of Human Nature* (1738) posits the necessary erasure of any qualitative difference between inferences. He argues, "in the most usual conjunctions of cause and effect we are as ignorant of the ultimate principle, which binds them together, as in the most unusual and extraordinary."⁸¹ Given that causation is so opaque that regular occurrences should be as mysterious as anomalous ones, supposed knowledge from habit and repeated experience is but a genre of speculation, or, indeed, projection. Hume famously offers no proper substitution for induction, but this undermining of knowledge only affirms the reasonableness of projection. On this topic, Hume claims, "We readily forget, that the designs, and projects, and views of men are principles as necessary in their operation as heat and cold, moist and dry."⁸² In categorizing projects as "natural," Hume neutralizes arguments about the relative vice or virtue of projects in "moral" or "civill" terms. Rather, projects become evidence of the fact that the category of vice cannot be mapped upon that of the "unnatural," nor virtue onto the "natural." These distinctions are useful in considering Swift's treatment of projects across *Gulliver's Travels*, as a significant body of criticism has aligned Swift's sense of the vice in human nature with the act of projection, while imagining the vice of projection to lie in its opposition to (the rest of) nature. Hume's treatise gives

philosophical rigor to the ambiguities and contradictions of Swift's fiction. As we have seen, *Gulliver's Travels* invites a condemnation of the rhetoric of certainty as applied to future occurrences, but also suggests a redirection of this scrutiny towards all supposed matters of fact. As Hume may have anticipated, the infinite ends of skepticism and the inaccessibility of true, primary knowledge would necessitate a turn to faith as the substrate of understanding and significance.⁸³ A side effect of dissolving both material and rational coherences is not only that the habitual and miraculous are levelled, but also that exterior and interior measures of probability are levelled, such that fictional causality becomes the only causality.

The more skepticism one finds in Swift, the further *Gulliver's Travels* surpasses its status as a parody of empiricist fiction to the point that it becomes a kind of validation. Swift's adoption of Royal Society style, his inclusion of maps and diagrams, and his laughably insufficient performances of realist hesitation make sport of equivalent gestures in *Robinson Crusoe* and other fictions that maintain a claim to historicity, but these gestures may be read as contiguous rather than oppositional. That is to say, both *Gulliver's Travels* and *Robinson Crusoe* affirm not only the entertainment value but the wisdom of treating all inductive inferences as a species of fiction making. While there are some apparent affinities between Swift's fiction and Hume's critique of inductive knowledge, Defoe's frequent use of the language of the miraculous would seem to put him at odds with that concept's foremost detractor. But Defoe's fiction, as we have seen, abounds with instances of poor induction, and Crusoe's frequent analytical vacillation is almost an ideal illustration of Hume's insistence on ignorance. That Defoe's characters ultimately embrace a supernatural framework for understanding causality is not at all incompatible with Hume's theory. Defoe's commitment to providential explanation within an empirical framework evidences an anticipation of the void that Hume's critique opens up, and

thus Defoe embraces the condition of ignorance as an aspect of faith. Defoe's characters routinely demonstrate an understanding that the miraculous is not a distinct category of event, but rather an attitude or inflection, arrived at through the realization that everything can appear miraculous or nothing can.

The alternative to this skeptical approach, which negatively justifies both the probability of projects and fiction, is voiced throughout history but is systematized in the later eighteenth century under the name of "common sense."⁸⁴ Thomas Reid's *Inquiry into the Human Mind on the Principles of Common Sense* (1764) attempts to counter the unactionable skepticism of Hume's *Treatise* by presenting common sense as a faculty that, through the collectivity of human experience, bridges the categories of experience and knowledge. Reid navigates around the pitfall of a priori knowledge by depicting common sense as acquired, but in an exceedingly regular and automatic fashion:

T]his connection between our sensations and the conception and belief of external existences cannot be produced by habit, experience, education, or any principle of human nature that hath been admitted by philosophers. At the same time, it is a fact that such sensations are invariably connected with the conception and belief of external existences. Hence, by all rules of just reasoning, we must conclude, that this connection is the effect of our constitution, and ought to be considered as an original principle of human nature.⁸⁵

The salient feature of Reid's common sense, then, is that it is true not only by virtue of being common, which to say it operates according to more than a frequentist epistemology. While Hume walks back some of the boldest claims in the *Treatise* by conceding, in the revised *Enquiry Concerning Human Understanding* (1748), that there is such a thing as testimony so universally agreed upon that it becomes unreasonable to doubt, Reid ascribes such agreement to a shared human principle rather than simply the multiplication of experiment. The fact that common sense ideas acquire

“the consent of ages and nations” is empirical evidence of a species-typical function that, ideally, transcends cultural boundaries and distinctions of high and low opinion.⁸⁶

A critique of common sense that would pursue Reid throughout his lifetime is that his theory conflates majority opinion with universal prescription. We see a version of this critique already in *Gulliver's Travels*, where, relative to any invocation of common sense, there is someone who would defy it, and not always from a minority position. While it appears satisfying to dismiss the projectors on the grounds of their ignorance of common sense, the King of Brobdingnag's rejection of violence is premised on his adherence to common sense and his humanity, both of which then exclude Gulliver, and the European branch of humanity to which he and the reader belong. Gulliver ironically ascribes the King's convictions to a “narrowness of thinking,” where, according to Reid, his principles ought to be maximally diffuse. The critique of common sense is not, in Swift's case, levelled against any particular idea, but the manifest overstatement of the fiat epistemology. Defoe, Swift, and later Hume use the logic of frequentist probability against itself, so that repetition or non-observation cannot be made a basis for real knowledge. What common sense proposes is essentially an ideal correspondence between the macroscopic propositions of frequentism and individual judgement, whereby the true becomes the true in general and vice versa.

The problems of common sense as an earnest epistemology however, are lost in the translation to fiction, where as we have seen, the problems of frequentist probability are not. As a mode of assessment, common sense is akin to what we have been calling internal probability turned outward onto the world. In the following chapter, we will look at assessments of the probability of fictions through the present day according to various iterations of internality. The form of probability specific to the novel—as it is advertised, for instance, by Fielding—resists

theorization, and is established equally by the criteria of frequentist observation and intuition. The probable in the novel becomes more of a sensibility than a degree of accuracy, and in this sense ceases to concern itself with the narrowness of its relevance.

Notes

¹ Defoe, *Robinson Crusoe* ed. John Richetti (New York: Penguin, 2003) 123

² This is not to say insignificant, but rather deliberately inexact, in the manner of quantities listed in fables, or the hundred thousand souls of H.F.'s verse, or, more immediately, Crusoe's own assertion that "fear of danger is ten thousand times more terrifying than danger it self." *Robinson Crusoe* 126

³ See Paul K. Alkon, "The Odds Against Friday: Defoe, Bayes, and Inverse Probability," *Probability, Time, and Space in Eighteenth-Century Literature* ed. Paula R. Backscheider (New York: AMS Press, 1979) 29-62.

⁴ Molesworth reads the return of Roxana's daughter as Defoe evoking the improbable for improbability's sake, as this event is not ultimately as significant to the narrative. See Molesworth, "'A Dreadful Course of Calamities': Roxana's Ending Reconsidered" *ELH* 74.2 (2007) 493-508

⁵ *Robinson Crusoe* 63

⁶ For an account of this episode's importance to the work's conversion narrative see John Richetti, "Secular Crusoe," *Eighteenth-century Genre and Culture: Serious Reflections on Occasional Forms: Essays in Honor of J. Paul Hunter* eds. Dennis Todd and Cynthia Wall (Newark: University of Delaware Press, 2001) 58-78

⁷ See Sarah Tindall Kareem, *Eighteenth-century Fiction and the Reinvention of Wonder* (New York: Oxford University Press, 2014) 75-78

⁸ The quotation of this term is, through numerous intermediaries, from Max Weber's formulation of Enlightenment *Entzauberung der Welt* (disenchantment of the world), which is itself a quotation from Schiller. In recent decades scholars of literature, philosophy, history, and religion have insisted on the overstatement of this disenchantment with reference to the eighteenth century. See, for instance, Latour, *We Have Never Been Modern*; Joshua Landy and Michael Saler (eds.), *The Re-Enchantment of the World* (Stanford: Stanford University Press, 2009); and Jane Bennet, *The Enchantment of Modern Life: Attachments, Crossings, and Ethics* (Princeton: Princeton University Press, 2006). For Weber, and Schiller, enchantment is the other of secular sterility. My own use of the word "enchanted" to mean "conspicuously fortunate in a manner seemingly at odds with contemporary canons of verisimilitude," echoes similar usage by Thomas Kavanagh, Molesworth, and Kareem.

⁹ Daniel Defoe, *An Essay Upon Projects*, eds. Kennedy, Seidel and Novak (New York: AMS Press, 1999) 11. All subsequent references will be to this critical edition unless otherwise specified.

¹⁰ See Emerson Baker and John G. Reid, *The New England Knight: Sir William Phips, 1651-1695* (Toronto: University of Toronto Press, 1998). Baker and Reid endorse Defoe's characterization, especially as developed in Viola Florence Barnes, "The Rise of William Phips" *The New England Quarterly* 1.3 (1928)

¹¹ Molesworth 38

¹² See nylottery.ny.gov

¹³ In a letter to Pope, Swift reports that Arbuthnot, a fan of the work as a whole, "likes the Projectors least... some think it wrong to be so hard upon whole Bodies or Corporations..." see "Swift to Alexander Pope," 26 Nov. 1726, *Select Letters to Jonathan Swift* vol. 4, ed. William Duncan Taylor (London: Bell, 1926) 224

¹⁴ Hooke attended a performance and identified himself as the object of satire. See Tita Chico, "Gimcrack's Legacy: Sex, Wealth, and the Theater of Experimental Philosophy," *Comparative Drama* 42.1 (2008) 29-49.

¹⁵ Shadwell, *The Virtuoso* eds. Marjorie Hope Nicholson and David Stuart Rhodes (Lincoln: University of Nebraska Press, 1966) 112

¹⁶ The mechanics of preaching are also a topic of satire in Swift's *A Tale of a Tub*.

¹⁷ Al Coppola draws attention to Gimcrack's flawed economy of attention, which keeps him occupied with trifles as his wife is seduced nearby, or focused on insects at the expense of Roman antiquities. Coppola, *The Theater of Experiment* (New York: Oxford University Press, 2016) 47.

¹⁸ Richard Bevis, *English Drama: Restoration and Eighteenth Century 1660-1789* (New York: Routledge, 2013) 89-90

¹⁹ Koji Yamamoto, "Piety, Profit and Public Service in the Financial Revolution," *English Historical Review* 126.3 (2011)

²⁰ Jonson, *The Devil is an Ass* ed. Peter Happe (New York: Manchester University Press, 1996) 91

²¹ *An Essay Upon Projects* 73-75.

²² *Ibid.* 13

²³ Kimberly Latta, among others, notes the word's etymology, from the Latin *proicere*—to cast or to throw. Projection as an idea thus combines the notion of forward progress and the games of chance. See Kimberly Latta, "'Wandering Ghosts of Trade Whimsies': Projects, Gender, Commerce, and Imagination in the Mind of Daniel Defoe," *The Age of Projects* ed. Maximillian E. Novak (Toronto: University of Toronto Press, 2008) 141-165

²⁴ *An Essay Upon Projects* xxi

²⁵ Several critics speak of good and bad projectors, as does Defoe himself on occasion, but I believe the inherent value of projection as a practice to be essential to Defoe's defense.

²⁶ *An Essay Upon Projects* 15

²⁷ This would explain Defoe's insistence on the arrival of a particular "Age of Projects," even as he argues that projects have always existed. By citing a condition of necessity, Defoe is able to let outside conditions perform the impossible task of distinguishing projects that would benefit the state from those that would only create wealth for certain individuals. It is in a time of crisis that Defoe seems to subscribe to the Mandevillian alignment of private and public interest.

²⁸ See Latta 150-160

²⁹ Marjorie Nicholson and Nora Mohler, "The Scientific Background of Swift's Voyage to Laputa," *Annals of Science* 2 (1937) 405-430

³⁰ I borrow this metaphor from Defoe's portrayal of projection as the incestuous child of avarice and the prior offspring of avarice with trade. See Latta 150-151

³¹ Swift, *Gulliver's Travels* in *The Cambridge Edition of the Works of Jonathan Swift* ed. David Womersley (New York: Cambridge University Press, 2012) 251-253. Hereafter cited as *Gulliver's Travels*

³² *Gulliver's Travels* 259

³³ Though she does not address this episode of *Gulliver's Travels*, Sophie Gee argues generally that in eighteenth-century fiction, the presence of waste is often a shadow signifier for the production of value. See Gee, *Making Waste: Leftovers and the Eighteenth-Century Imagination* (Princeton: Princeton University Press, 2009)

³⁵ Patey, "Swift's Satire on 'Science' and the Structure of *Gulliver's Travels*," *ELH* 58.4 (1991) 817

³⁶ This version of quasi-coprophagia appears in Richard Head's, *The English Rogue*, in which the narrator's landlady, seeing him "evacuate" a meal, offers to re fry it for him, as it was "but little differing from what I had eaten a quarter of an hour before. To which the narrator reacts, "I should have dyed with laughter at the strange proposition; but the woman star'd upon me, not knowing whether I grin'd or laught." *The English Rogue Described, in the Life of Meriton Latroon, a Witty Extravagant: Being a Compleat History of the Most Eminent Cheats of Both Sexes*. (London: 1665) 225

³⁷ Nicholson and Mohler reference Hales, but discount him as a direct source on account of *Gulliver's Travels* appearing in print before *Vegetable Staticks*. The *Philosophical Transactions of the Royal Society* do, however, record the reading of Hales's manuscript in April 1725.

³⁸ Howard Gest, "Sun-beams, Cucumbers, and Purple Bacteria: Historical Milestones in Early Studies of Photosynthesis Revisited," *Photosynthesis Research* 19.3 (1988) 287-308

³⁹ *The Annotated Gulliver's Travels* ed. Isaac Asimov (New York: Crown, 1980) 167

⁴⁰ Ibid. 170

⁴¹ In his "Sermon on the Trinity," Swift's defense of the trinity against the skepticism of natural philosophy is based in a skepticism of human understanding. But this dynamic may be reversed, so that some profane scientific ideas might themselves be true despite disagreeing with man's learned assessments.

⁴² *Gulliver's Travels* 258

⁴³ This letter performs a microcosmic version of the meta-skepticism I find in *Gulliver's Travels*. Concluding his briefing from London, Swift reports "A projector has lately applied to me to recommend him to the ministry about an invention for finding out the longitude. He has given in a petition to the queen by Mr. secretary St. John. I understand nothing of the mathematicks; but am told it is a thing as improbable as the philosopher's stone, or perpetual motion." This dismissal of a projector as such initially appears an unfortunate instance of Swift's overzealous anti-modernity, but the force of the sentiment is shortly overturned by the sign-off "your grace sees I am a projector too," which seems to shift the problem of improbability from the figure of the projector generally to the particular project. Swift to Archbishop King, 29 March 1712, in *Correspondence of Jonathan Swift*, ed. David Woolley, 4 vols. (Frankfurt am Main: Lang, 1999-2007) I, 421.

⁴⁴ As J.M. Treadwell remarks of this passage, "There is nothing in the career of Lemuel Gulliver to support such a confession, but there is a good deal in the career of Jonathan Swift." Discussing "A Proposal for Correcting..." at length, Treadwell notes the naïve, self-evident quality of Swift's earnest propositions. Treadwell recognizes a defense of projection in *Gulliver's Travels* in Gulliver's disapproval of the more reasonable political projectors at the expense of the outlandish, linking this irony to Swift's belief in himself as a "benevolent projector," who is enthusiastic about sensible solutions to problems caused by vice. But in this reading, Swift receives his own wrath for the optimism inherent in being a satirist. That is, Gulliver's self-reproach for attempting to reform Yahoos is

Swift's own for attempting to reform humans. This resolution relies on a fairly straightforward reading that does not, in my opinion, do justice to Treadwell's extensive research. If we merely substitute Swift for Gulliver as the one-time projector out of respect for the novel's assumed time-scheme (which puts Gulliver's projecting career later, though it appears earlier in the text), projection is confined to a discrete action of the sort in which Swift partakes through either proposals or satires, rather than a more comprehensive form of thought which, in Defoe's understanding, is immutable. "Jonathan Swift: The Satirist as Projector," *Texas Studies in Literature and Language* 17.2 (1975) 439-460.

⁴⁵ *Gulliver's Travels* 260

⁴⁶ David Alff, "Swift's Solar Gourds and the Rhetoric of Projection," *Eighteenth-Century Studies* 47.3 (2014) 245-260

⁴⁷ *Gulliver's Travels* 194

⁴⁸ Emphasis on agriculture is common across Swift's text, and this passage particularly echoes the claim in *A Short View of the State of Ireland* that "the Fruitfulness of the Soil" is "the first Cause of a Kingdom's thriving." Swift, *Irish Tracts* ed. Herbert Davis *Prose Works of Jonathan Swift* vol. XII (Oxford: Blackwell, 1955) 5

⁴⁹ Claude Lévi-Strauss, *The Savage Mind* trans. Weidenfeld and Nicolson (Chicago: University of Chicago Press, 1962) 263

⁵⁰ While Part IV sowed controversy in Swift's time for its portrayal of a utopia from which Christianity is absent, critics have consistently found echoes of Protestant, and especially Puritan, doctrine in Houyhnhnm discourse, or else have read Gulliver's admiration of his masters as a satire of conversion. These readings hinge on the paradox of what Margaret Thickstun calls "radical Christianity's desire to exhort perfection from the very humanity it condemns." See Thickstun, "The Protestant Origins of Gulliver's Conversion in Houyhnhnmland," *SEL* 37.3 (1997) 517-534 and William Casement, "Religion, Satire, and Gulliver's Fourth Voyage," *HEI* 14.2 (1992) 531-544.

⁵¹ Citing the work of Frederik Smith on Swift's language, Frank Boyle argues that New Science and Puritanism share a "common Modern methodology." See Smith "Scientific Discourse: *Gulliver's Travels* and *The Philosophical Transactions*," *The Genres of Gulliver's Travels*, ed. Smith (Newark: University of Delaware Press, 1990); Boyle, *Swift as Nemesis* 31, 104-117

⁵² Kareem 107

⁵³ *Gulliver's Travels* 422

⁵⁴ *Ibid.* 408

⁵⁵ *Ibid.* 422

⁵⁶ Recall that siege-craft is an arena held up by Defoe as illustrative of the value of projection, and that Gulliver's conversation with the king initially takes the form of a proposal to increase his power.

⁵⁷ See Terry Castle, "Why the Houyhnhnms Don't Write: Swift, Satire and the Fear of the Text," *Essays in Literature* 7.1 (1980) 32-33

⁵⁸ As well as Wilkins's notorious proposal for a universal language

⁷² *Gulliver's Travels* 296

⁷³ Thomas Birch, *The History of the Royal Society of London* (London: 1756), vol. 2, 68-73. For an account of Hooke's theories of gravitation and his quarrel with Newton, see Robert D. Purrington, *The First Professional Scientist: Robert Hooke and The Royal Society of London* (Basel: Birkhäuser, 2009) 168

⁷⁴ Boyle, *Swift as Nemesis* 106-107

⁷⁵ Jess Keiser, "Very Like a Whale: Metaphor and Materialism in Hobbes and Swift" *Modern Philology* 113.2 (2015) 202

⁷⁶ Pope and Fielding have similar remarks about the practice of index learning. See Robin Valenza, "How Literature Becomes Knowledge: A Case study," *ELH* 76.1 (2009) 215-245

⁷⁷ *Gulliver's Travels* 146-147

⁷⁸ In the oft republished translation of Pliny by John Bostock, for instance, the words "naturae lusu" are routinely translated as "Nature, in a/her sportive mood." Phenomena that evidence this sportive mood include flowers, vines, and shellfish. See John Bostock and Henry Riley *Natural History of Pliny* (London, 1893). The *OED* supports this definition for "lusus naturae," which is used more frequently in the seventeenth and eighteenth centuries than in antiquity.

⁷⁹ See Stephen Toulmin, *Cosmopolis: The Hidden Agenda of Modernity* (Chicago: University of Chicago Press, 2013) and Boyle 20

⁸⁰ Patey, "Swift's Satire" 817

⁸¹ David Hume, *A Treatise of Human Nature* eds. David Norton and Mary Norton (New York: Oxford University Press, 2005) 113

⁸² *Ibid.* 305

⁸³ For analysis of how Humean skepticism provides a framework for faith, see Susan Manning, *The Puritan-Provincial Vision Scottish and American Literature in the Nineteenth Century* (Cambridge: Cambridge University Press, 1990). For an explanation of the differing trajectories of Swift and Hume from a shared departure from Lockean empiricism, see McKeon, *Origins* 80-82.

⁸⁴ Reid's explicit reference in his use is Cicero's *sensus communis*

⁸⁵ Thomas Reid, *Inquiry and Essays* eds. Ronald Beanblossom and Keith Lehrer (Indianapolis: Hackett, 1983) 44

⁸⁶ Reid, "Essays on the Intellectual Powers," *Op. Cit.* 156

Chapter Four

Confined Narratives: Probability as a Feature of the Novel

Defoe and Swift illustrate, in converging manners, the inadequacy of observational frequency in making judgments from probability. In Crusoe's persistent discourse of unlikelihood, Defoe attempts to justify the events of his fiction according to a counterintuitive form of external probability, that is, to insist that what happens to Crusoe is the sort of thing that would happen outside the confines of the fiction. In *An Essay Upon Projects*, Defoe defends what is evidently unlikely by demonstrating how it is possible to conceive of any event as being unlikely, even to extreme degrees. Taken as a category, the extremely unlikely occurs regularly, which is to say, things deemed unlikely within some frameworks may be less unlikely or even regular within others. This skepticism can be invoked to accommodate the aesthetic value of surprise to the epistemological framework of the probable, and, "externally," to defend the rationality of pursuing novelty in arts and sciences ("le vrai peut quelquefois n'être pas vraisemblable"). In *A Journal of the Plague Year*, Defoe's explicit ambition to "fill [readers] with surprise" is related to an assurance of the truth of his account, but that assurance entails a differentiation between the empirical facts of his account and the truth of the plague, which is not, and perhaps cannot ever be described as a set of clear propositions. The problem, framed by Locke and pushed to its logical ends by Hume, is that no amount of data, directly encountered or otherwise, can be abstracted beyond itself with any real credence (for Locke, this means that, from a closed room, one can never be sure that there are in fact any other people on earth, and for Hume, this means one cannot say the sun will rise tomorrow). Swift seems to endorse a recourse to common sense that will resolve such impasses, while at the same time illustrating how

cripplingly insufficient experience and custom can be as means of rendering the world intelligible.

The association of probability with fiction, made most explicitly by Hume, diminishes the esteem of the former but also implies an epistemological function for the latter. If considerations of what is likely to happen in the actual world are a species of fiction, it follows that fiction is the tool by which relations of probability can be made visible, and by which the mind trains itself in this operation. This is of course the perceived capacity that fuels anti-novel sentiment through the eighteenth century, especially against those works that advertise themselves as probable rather than strange and/or surprising. While early novels may be accused of lying, and all species of fiction bear criticism for cultivating fancy, the mature English novel fomented controversy for its claims of probability. This chapter will thus examine a drift in the concept of fictionality in the novel form across the eighteenth century, from serving as a medium for exploration and meditation upon the possible (as in the works of Defoe), to assuming the very boundedness of probability against which the novel developed. Novelistic claims to probability, most famously those of Fielding, are often presented as correlative to the renunciation of truth claims. Where “true in general” is a defensive posture for Defoe, it is put forth by Fielding as a merit of fiction.

In the first chapter, I noted the loose affinity between the implicit or explicit contractual structure of speculative scientific fictions and later eighteenth-century novels in order to illustrate that claims to internal probability are not necessarily limited to fiction, at least as fiction becomes commonly understood to be antithetical to science.¹ The maturation of the novel has long been spoken of in terms of an internalization of probability, moving away from attempts at replicating the world “as it is” in fiction, and embracing some coherent conception of a fictional world.² And, for this reason, the version of novelistic probability that informs the English novel going

forward has been characterized in terms of a return to probability in the classical, dramatic, and moral sense, though, undoubtedly, marked by the intervening period of scientific and, occasionally, mathematical direction. Aside from advancing chronologically, this chapter breaks from those preceding it in that it focuses on works that do not explicitly engage with questions of science. As I will argue, however, the articulation of internal probability in genre-defining novels is drawn as much from the metaphysical and mathematical revolutions of the seventeenth century as from early modern narrative forms.

This account presupposes that the species of fiction that defines the mid-century novel is indeed novel. Canonical at least since Watt, this line of thinking is not universal. Its defense is, for instance, the premise of one of the more widely cited arguments about the nature and historical import of the novel in recent decades, Catherine Gallagher's essay on "The Rise of Fictionality." While it is difficult to endorse unhesitatingly Gallagher's claims that "The novel is not just one kind of fictional narrative among others; it is the kind in which and through which fictionality became manifest, explicit, widely understood, and accepted" or more succinctly that "the novel discovered fiction," it is important to highlight, as she does, that novelistic fictionality is "unique and paradoxical." The novel is paradoxical, for Gallagher, because it is manifestly fictional while "locked inside the confines of the credible."³ For Gallagher, the credible seems to be defined according to the same double articulation of common sense, as both that which is externally probable (frequently observed) and that which is agreeable to extra-empirical judgment.⁴ Whether or not there exist genres predating the mid-eighteenth century that could be conceived of similarly is not at issue in this study. In the following pages, however, I examine how novels display awareness of the confines of the credible. To the degree that my analysis suggests any discrete evolutionary step between the works of Defoe and the mid-century novel—

“the novel” of Gallagher’s argument—it is not the uneasy abandonment of the truth claim, but a proactive approach to the elucidation of these confines. Whereas Defoe’s appeal for credibility in *A Journal of the Plague Year*, as well as in moments of *Robinson Crusoe* and other novels, involves a shrug at the unknowability of creation and the laws that adhere in it, later novelists generally accept the condition that fictional universes ought to contain fewer than an infinite set of possibilities.

The works that receive the most sustained attention in the following arguments, Richardson’s *Clarissa* (1748) and Sterne’s *Tristram Shandy* (1759-1767), do not employ what I have called the fiat probability of Kepler, Godwin, and Cavendish, in which the probability of a narrative becomes evident by soliciting the reader to accept it as so (in the case of Kepler, and to a lesser degree Godwin, the idea is to turn internal probability outward to evidence scientific hypotheses). Where I identify external probability in them—and in the case of *Tristram Shandy* this amounts to a shadow presence in the work as a whole—it is, however, premised on a kind closure. The difference from these earlier narratives is that the conditions of closure are not merely the conditions that the author has established; they are, so to speak, imported. In *Clarissa*, I argue, probability is articulated as a principle that delimits an original range of possible outcomes in a manner analogous to Leibnizian metaphysics. In *Tristram Shandy*, the narrative problems posed by contingency are solved by one character’s embrace of a closed representational world of mathematical abstractions. In both cases, probability is expressed as the isolation of a probable domain within the infinite range of possibility, associated with freedom and chaos respectively.

Clarissa's version of confinement, as I will argue, is related to but distinct from a conventionally cited premise of verisimilitude, the isolation of human interest or human nature as a site of probability within a fictional narrative. The probability of characters is itself susceptible to both external and internal considerations, that is, whether the portrayal of characters is consistent with people as they really are and whether the extreme qualities and behaviors of fictional characters can be taken of a piece with the fiction to which they belong (and, also internally, whether they are consistent with themselves across a work). Eighteenth-century novels are of course heterogeneous in their negotiation of these questions, and the distinction between internal and external is as much a matter of modern critical utility as an identifiable aspect of literary history. Both metrics, for instance, appear in the most widely cited meditation on the matter, Coleridge's defense of representing "persons and characters supernatural, or at least romantic, yet so as to transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith."⁵ Probability of the limitedly external sort is more common across the eighteenth century, for instance in Frances Burney's explanation, in the preface to her 1778 epistolary novel, *Evelina*, that "probability" accounts for her heroine's being "No faultless Monster that the world ne'er saw; but the offspring of Nature, and of Nature in her simplest attire,"⁶ or Walpole's above-referenced appeal that his reader "Allow the possibility of the facts, and all the actors comport themselves as persons would do in their situation."⁷ Here the paradox of the novel is on full display, as the reader must judge events as if they were actual, while refraining from applying the standards of external probability to the work as a whole (e.g. not dismissing the story because giant helmets are not known to fall from the sky). Characters

and events are both to be distinguished as sites of judgment, while the one cannot be considered without reference to the other.⁸

Both internal consistency and human likeness as criteria have ancient antecedents, and are taken up by medieval and early-modern rhetoricians, but in their incorporation into the novel form, both are invigorated by Locke's *Essay*. Laying out the grounds of probability, Locke determines two essential categories, "*First*, The conformity of any thing with our own Knowledge, Observation, and Experience," and "*Secondly*, the testimony of others." This latter category contains its own set of determining factors, most of which refer to the source of the testimony (the number of witnesses, the existence of contrary testimony, motives, integrity, etc.). One canon stands out, however, for its potency as a standard for probable fictions, and that is "The Consistency of the Parts, and Circumstances of the Relation," which I have cited throughout this study.⁹ As Patey notes, the capacity of this standard to migrate from testimony to be assessed on the basis of truth, to fiction to be assessed on the basis of internal probability, is a perpetual source of controversy among rhetoricians and critics.¹⁰ Bacon was an early opponent of probability-as-consistency as a means of actually acquiring knowledge, dismissing arguments drawn from logical trains as derivative or redundant.¹¹ Over the course of the novel's eighteenth-century rise, the precise nature of internal probability is never quite resolved, and it is left for later figures like James Beattie, John Hawkesworth, and Coleridge to define an already evident but still amorphous concept, variously called "poetical probability," "moral probability," or "dramatic probability." While Coleridge and Richard Hurd reference "poetical truth" and "dramatic truth," respectively, George Campbell sees fit to revise Locke's definition of probability in order to delineate a "sister" concept, plausibility, which has "greater efficacy in arousing the passions."¹² Largely consistent with the common sense philosophy of the later

eighteenth century but also suggestive of Gallagher's fictionality, Campbell's 1849 theory of plausibility attempts to capture the feeling or effect of probability without being bound to any actual world framework; it is a uniquely fictional quality of appearing true. As Defoe and Swift well knew, things actually capable, or even likely to occur often do not appear as such, thus propounding the question of whether probability may or ought to be defined only by appearance.

As for the question of human or characterological probability, framed by Walpole in the terms "as persons would do," Locke's essay is again both a crucial source of insight and an axis of continual revision. While denying the presence of innate principles, Locke also accommodates principles known by the "light of nature," and which thus are not strictly determined by experience of external objects. This form of knowledge, intuition, is the highest form, because it is not degraded by processes of reason or judgment. While theories of knowledge after Locke only continue the trend of devaluing probability in relation to certainty while stressing the inaccessibility of the latter, personal and interpersonal intuition remains a privileged faculty, for instance, in Hume's *Treatise*, which solicits marvel at the capacity of human nature to "receive by communication" the "inclinations and sentiments" of others.¹³ In Adam Smith's *Theory of Moral Sentiments*, and across common sense philosophy, the automatic or intuitive quality of sentiment is translated outward as a more general epistemology, essentially broadening Locke's narrow light of nature to illuminate a range of potential objects of apprehension.¹⁴

Though these two avenues for the advancement of probability claims (internal consistency and appeal to human nature), both perfectly suited to fictional application, are visible in the works discussed below, they are sidestepped in favor of what might be considered rearticulations of external probability. Richardson's *Clarissa* occupies a monumental place in the history of the novel because of its formal emphasis on the interiority of characters at the expense

of events. Perhaps the most widely quoted single statement on the novel is Dr. Johnson's claim that "if you were to read Richardson for the story... you would hang yourself... you must read him for the sentiment."¹⁵ Modern critics have, while withholding such animus, more or less agreed with this assessment, and have described Richardson's contribution to the form in terms of a "turn inward."¹⁶ In recent years, however, much *Clarissa* criticism has coalesced around the questions of form that would define the novel's actions—abduction, rape, and murder—as such. In other words, the novel's presentation of human sentiments is held against its actions as a site of both intrigue and meaning. No novel should be more perfectly illustrative of the shift from world to human, or from natural philosophy to moral intuition as a measure of probability. I argue, however, that probability in *Clarissa* is at least equally constructed according to that other canon, the "consistency of the parts," but furthermore that the logic of consistency that Richardson posits is not entirely internal. *Clarissa* may be read as an attempt to counter the reasoning (wielded both by proponents of modern science like Defoe and skeptics like Swift) that made earlier claims to external probability unwieldy, namely the fact that outside of literature, probability and improbability may be understood as provisional and necessarily incomplete judgments. Richardson's novel not only limits its significant events, but makes speculations about and predictions of their occurrence a major subject of epistolary discourse. In composing a novel around precisely the events the speakers of that novel identify as probable, Richardson offers a version of internal probability so extreme as to signal beyond itself. Where Defoe's narratives suppose a vantage point from which anything is improbable, *Clarissa* demands an understanding of the actual world as bound and determinate. The novel becomes not a fiat dominion, but an experimental space in which the laws that adhere outside of it are made

manifest. To illustrate what might be called the metaphysics of Richardson's novel, I will first differentiate my account from the majority of "possible worlds" criticism.

Worlds History

A truism often repeated wherever possible worlds are discussed in relation to literature is that such discussion is "inspired" by Leibniz's articulation of the concept. In actual practice, the genealogy of influence is such that Leibniz is cursorily referenced as a historical antecedent for twentieth-century analytic philosophers who are the more direct sources of literary theorists' interest. Possible worlds analysis of literature is a subfield (or perhaps a sub sub-field of narratology) that largely treats literature as susceptible to practices like formal logic and computer science, and thus requires some axiomatic, generally ahistorical determinations for viable subject matter, namely fictional narrative. Recent publications tend to the theorization and testing of applications for recent and especially hybrid literary genres, while "fiction" and "novels" are taken as ideally stable concepts that, for the sake of familiarity, tend to the nineteenth and twentieth centuries for reference cases. This latter tendency implicitly affirms Gallagher's formulation that the modern set of expectations for fictionality correspond to the canons of credibility instantiated by the mature novel over the latter half of the eighteenth century. A possible world, as a literary concept, seems intuitively to refer to a fictional world in which the physical and social realities of the actual world are replicated probabilistically (that is to say, absent of earnest truth claims). As such, possible worlds theorists take up questions of how to understand the conditions by which fictional worlds exist, and how to square their referentiality with their self-referential autonomy. These questions produce the most viable answers, or sets of competing answers, when applied to novels like *Madame Bovary*, *War and*

Peace, and *Sherlock Holmes*, that are written from within established traditions of credible fiction. What follows is an attempt to think through possible worlds in their original late-seventeenth and early eighteenth-century formulation as a potential source of insight into the earliest articulations of novelistic worlds, and to attribute to the novel form its own metaphysical potential.¹⁷

The major theorists working within possible worlds analysis: Thomas Pavel, Umberto Eco, Lubomír Doležal, Ruth Ronen, Marie Laure-Ryan, etc., adopt much of their language from analytic philosophy, specifically scholars like Saul Kripke and David Lewis, who use the language of worlds to solve problems of semantics, and especially those related to modal or counterfactual statements. In its crudest outline—so as to avoid glossing an entire, highly-technical field of discourse—possible worlds are useful for understanding and modelling the significance of propositions that do not refer to an extant state of affairs. Lewis, for instance, begins his study of counterfactuals with the example: “‘*If kangaroos had no tails they would topple over*’ seems to me to mean something like this: in any possible state of affairs in which kangaroos have no tails, and which resembles our actual state of affairs as much as kangaroos having no tails permits it to, the kangaroos topple over.”¹⁸ The worlds Lewis speaks of are abstract, spatialized domains for performing operations that are mathematical in nature. Their significance as references, however, can often come to depend on the degree of possibility they have of being obtained, and how much difference from the actual world is permitted before statements that reference them cease to be intelligible. Lewis is atypical among twentieth-century philosophers for being an actualist regarding possible worlds, that is, one who believes that all worlds that are not premised on any logical inconsistency do, or at least could, exist in the universe (for instance, a world of tailless kangaroos that are poorly balanced). For Lewis, the

difference between actual and possible is indexical, which is to say that it depends only on the vantage point of a speaking subject, and for more skeptical actualists like W.V. Quine, even the thought of differentiating worlds and organizing them in any way is irrational.¹⁹ In order to work with the concept of possible worlds, more utility-oriented thinkers like Robert Stalnaker have opted to treat possible worlds as being necessarily delimited by their degree of accessibility to the actual world.²⁰ This is the bind of treating possible worlds concretely, that they must refer to something distinct from but consistent with the actual.²¹

This problematic, as applied to fictional texts rather than real propositions, is among the original concerns of modern possible worlds literary analysis. Thinking of fiction as a set of statements about a possible world would seem to liberate the idea of fiction from the historical constraints introduced by traditional critics like Gallagher (i.e. that “fiction” is credible fiction, and is achieved in the eighteenth century), but ultimately problems of form and genre of the sort that occupy historians of the novel are reproduced as questions about the range of possible meanings of “possibility.” In *Fictional Worlds*, Thomas Pavel proposes a “literary semantics” rooted in the idea of the possible world, such that propositions originating in that world are to be taken as constitutive of it, and by default accurate (except in the case of an unreliable narrator or character). This is essentially an aesthetic version of Lewis’s indexical worlds, in that Pavel’s fictional world is to be understood as actual relative to itself, essentially collapsing the criteria of “external” and “internal” probabilities. The danger of this approach, as Pavel recognizes, is its non-prohibition of a “segregationist” approach, in which the fictional world is completely cut off from reference to the actual world. This would presumably entail treating similarities or instances of factual overlap as incidental, a position that is as hard to imagine seriously as its opposite, a “naïve realism” that would treat the actual world as the referent for any text

composed within it.²² While naïve realism does not admit the distinction between fiction and lying, segregationist approaches, even if they allow for something like “moral” or “dramatic” probability, still prohibit discussions of irony as well as political or ethical engagements.

Describing the middle way between these untenable extremes means, more or less, formulating what for historical critics amounts to knowledge of a given genre and for modern casual readers amounts to a set of empirical intuitions. Doležel attempts to avoid the pitfalls of thinking of literature in literal terms by making the incompleteness of fictional worlds their salient quality. In this way, a world is not unintelligible because it does not specify how many children Lady Macbeth has or how many hairs are on Sherlock Holmes’s head (for if Lewis is taken at his word, every possibility for these variable values would constitute another possible world), but Doležel must then rely on a concept of “texture” to describe how readers navigate questions of sense and reference. For Doležel as for Pavel, formal logic is unsatisfactory as a model for typical reading practices, which, like language, appear more complex under greater degrees of scrutiny but are largely susceptible to intuitive testing.

We will return to some examples of modern possible worlds analysis later, but we might say for now that the first arc of this sort of criticism is to address ontological questions of fiction. Thinking of a fictional text as supposing a possible world, however it is deemed possible—with reference to the world or itself—is a way of comprehending the qualities of a text that enable its readability. This species of investigation, like the semantic analysis from which it takes direction, is designed to theorize already familiar practices. Though Pavel and Doležel remark upon works like *Don Quixote* and *Madame Bovary*, whose content involves the problematic mapping of fictional worlds onto the (textual) actual world, their analysis is not intended to reconstruct the process by which concepts like possibility and probability historically transform in reference to

natural philosophy and mathematics as well as literature. The figure ostensibly at the source of this discourse, Leibniz, is indeed almost untenable as a guide for thinking about the conditions of fictional worlds, but, at least as far as the eighteenth-century novel is concerned, his doctrine of possibility can be a model for understanding how fictional worlds replicate the metaphysical conditions of the actual world.

As remains the case in analytic philosophy today, the most significant question surrounding Leibniz's possible worlds is the manner and degree to which they are possible. This question is intuitively raised by the most famous formulation of Leibniz's published work, the claim in the *Theodicy* (1710) that the actual world is "the best of all possible worlds." Across his writings from the 1680s until his death, Leibniz is insistent on the existence of these possible worlds as a necessary condition of the actual world, though not in a manner amenable to current actualist models. In the *Theodicy*, Leibniz asserts "In the region of the eternal verities are found all the possibles."²³ In *Monadology* (1714) he further explains that "if there is reality in essences or possibles, or indeed, in eternal truths, this reality must be grounded in something existent and actual, and consequently, it must be grounded in the existence of the necessary being, in whom essence involves existence, that is, in whom possible being is sufficient for actual being."²⁴ This understanding of possible worlds existing as an aspect of divine immanence is indeed more amenable to considerations of literary worlds than the similar but crucially divergent account of possibility offered in Spinoza's *Ethics* (1677), that the world consists of infinite possibility that has or will become actual at some point in this, singular, world.²⁵ While Spinoza's view proceeds from a general rejection of God as an anthropomorphized, willful agent, Leibniz's God is more or less analogous to an author of fiction.

Leibniz's sense of infinity is hierarchically organized, such that the infinity of possible worlds is the necessary byproduct of the actual world's perfection. The actualization of one world at the expense of others is often referred to as a choice, and can thus appear misleading in certain of Leibniz's arguments, so that when Leibniz is evoked in reference to fictional worlds, his metaphysics can be made out to align with Lewis's "ways things could have been" construction. What truly distinguishes Leibniz's possible worlds, however, is that they are rejected by choice but absolutely could not have been. The infinitely generative process of the actual world's coming into being is described in the *Theodicy* at the climax of a fable wherein a priest is led by Pallas through a series of halls containing alternate worlds:

The halls rose in a pyramid, becoming even more beautiful as one mounted towards the apex, and representing more beautiful worlds. Finally they reached the highest one which completed the pyramid, and which was the most beautiful of all: for the pyramid had a beginning, but one could not see its end; it had an apex, but no base; it went on increasing to infinity. That is (as the Goddess explained) because amongst an endless number of possible worlds there is the best of all, else would God not have determined to create any; but there is not any one which has not also less perfect worlds below it: that is why the pyramid goes on descending to infinity.²⁶

In this visualization, every possible world is stacked atop an infinite set of worlds to which it is superior until a single one is reached. For Leibniz, the essential benevolence of God rests in his inability to not choose the best world; a corollary of this obligation is that God also cannot conceive of one world without also conceiving of infinite others to be rejected, for only in this way can the choice be truly benevolent without any degree of the arbitrary.

Leibniz's potential utility for literary criticism, especially regarding the question of probability, did not take long to be recognized. An intriguing example of early possible worlds theory is the 1735 doctoral thesis of Alexander Baumgarten (now most widely known as the first to employ the term "aesthetics" to refer to a faculty of judgment). Baumgarten, an early disciple

of Leibniz, proposes a distinction between fictions that are possible or impossible in the real world, and further divides the latter category into two manners of impossibility: in the real world or in all possible worlds. This first category is called the heterocosmic, and corresponds to the sort of fiction taken as the basis for modern possible worlds analysis, while the latter is called “utopian.”²⁷ Utopian fiction, for Baumgarten, is simply not susceptible to the language of the probable, internal or otherwise, and it is heterocosmic fiction that enables probabilistic determinations. While modern critics such as Pavel have adopted the language of possible worlds to describe the constellation of consistent propositions that a fiction contains, such that probability is more a historically occurring feature than an essential quality, eighteenth-century criticism tends to be both more restrictive and more ambiguous about what constitutes an acceptable degree of probability. Possibility remains a condition of probability even in reference to completely impossible circumstances and beings. Addison’s *Spectator* no. 419 (1712), on “The Fairie way of Writing,” for instance, offers its argument as a rebuke to Modern disavowal of supernatural narratives, but nonetheless defends them according to their actual probability:

Men of cold Fancies, and Philosophical Dispositions, object to this kind of Poetry, that it has not Probability enough to affect the Imagination. But to this it may be answered, that we are sure, in general, there are many Intellectual Beings in the World besides our selves, and several Species of Spirits, who are subject to different Laws and Oeconomies from those of Mankind; when we see, therefore, any of these represented naturally, we cannot look upon the Representation as altogether impossible.²⁸

Even as the faculties of imagination and even previously maligned categories like fancy and wonder are assimilated to the realm of the intellect, probability is never released from conditions of possibility that are determined in reference to actuality. In *Spectator* 315 (1712), Addison proposes an assessment of fable and allegory according to standards of probable inference and causal rigor, insisting that, in allegory, not only the universal “meaning,” but also “the plain literal sense ought to appear probable.”²⁹ Addison’s liberation of judgment to accommodate

conjectural and/or non-human canons of probability does not give license to wholesale invention, which is to say, internal consistency as the only basis of literary probability. The worlds described by fiction cannot be any world, but rather must in some way replicate the actual world; the possibility to be embraced is not the possibility of other worlds so much as the possibilities bounded by this one.

As Leibniz's pyramid analogy illustrates, the infinity of worlds is but an inverse view of the more crucial elimination of all but one. Leibniz's worlds are rhetorically linked but logically opposed to the "plurality" of Fontenelle or the infinite variety of textually instantiated worlds proposed by Cavendish. Eighteenth-century critics of Leibniz, tellingly, took issue not with the pyramid's indeterminate base, but with the absence of possibility that remains in the tip, which makes this supposedly expansive theory almost indistinguishable from determinism.³⁰ If a novel is considered not as an alternate world to this one, but as its own proper "actual" world, with actors whose choices are tied to their being, it could be seen to obey a similarly deterministic course.

The Narrow World of *Clarissa Harlowe*

Eighteenth-century writers, as we have seen, often specifically addressed how their fictions were possible relative to the actual world. In the mode of naïve empiricism, there is no distinction between the two, but as soon as any degree of internal probability is recognized and the claim to strict referentiality is abandoned, a fictional world must be understood as its *own* actual world. Richardson's *Clarissa* is an ideal work for considering the role of possibility in

mediating determinations of probability in the novel because it maintains the formal verisimilitude of *Pamela* (1740) and other earlier novels—epistolary or otherwise—without concealing its fictionality. Its epistolarity necessarily decentralizes its propositional structure, and, more specifically, because its famed immensity of communicated thoughts and sentiments exists in inverse relation to its quantity of narrative events, it necessitates an alternative to the proposition-based understanding of textual worlds suggested by many narratologists. As *Clarissa*'s drama is rooted in ambiguity, it would be difficult to describe as a coherent set of facts and events. This difficulty does not simply reveal a hypothetical shortcoming of one relatively recent formal approach, but has, in a sense, been at the root of critical interest in the novel since its publication. Dr. Johnson's insult-couched defense of the novel prefigures the arguments put forth by twentieth-century critics for its canonization, namely its general eschewal of plot in favor of sentiment.³² The hierarchical status of interior activity over external action is not an incidental aspect of Richardson's composition, but itself an explicit directive for the work; the conflict between discrete actions and the sentiments surrounding them exists at the level of content. In other words, it dramatizes the blurring of external and internal criteria of probability.

As a literal justification for the epistolary discourse, and a rubric for reading the initial letters, the novel begins with the suggestion that its heroine will ultimately stand trial. The opening letter, written by Anna Howe to Clarissa Harlowe concerns a recent duel between Mr. Lovelace and Clarissa's brother, with Clarissa having been implicated as a person of interest. Thus she insists, "If anything unhappy should fall out from the violence of such spirits as you have to deal with, your account of all the things previous to it will be your justification" (L1, 40).³³ To which Clarissa acquiesces, "I will be as particular as you desire in the little history you demand of me. But heaven forbid that anything should ever happen which may require it to be

produced for the purpose you so kindly mention!" (L2, 41) The relatively innocuous wounding of James Harlowe is, of course, not the unhappy occurrence with which Clarissa's serial history in letter form will ultimately serve to justify her involvement. Rather, this interchange demonstrates the assumed logic behind the novel's structure (the correspondence between Clarissa and Anna occupying the vast majority of the novel's first hundred and fifty letters), that is, that Clarissa is transcribing her experience for Anna, who has established "a precautionary regard" towards her "fame" (L4, 53), in order that her relationship to any unhappy and, more important, unforeseen events may be recorded in case she stands either official or unofficial trial. Watt's championing of *Clarissa* fully accepts this premise as Richardson's vision.³⁴ As such, the novel's primary events—the abduction of Clarissa by Lovelace, his imprisonment and rape of her, and her death—achieve meaning only in relation to Clarissa's and Lovelace's subjective testimony. "A bare summary of the events," Watt argues, "might suggest that Clarissa courted her fate; and only a full knowledge of her sentiments and aspirations and the certainty that Lovelace understood them well enough to realize the enormity of the offense, enables us to understand the real nature of this story."³⁵

The success of *Clarissa*, for Watt, lies in its elaboration of sentiments to clarify the meaning of actions, and this is achieved by the epistolary form's insistence on interiority. Watt credits Richardson for his achievement of unqualified identification between reader and character, according to the axiom that "we identify not with actions and situations but with the actors in them" and that "all literature depends on this human capacity for projection into other people and their situations."³⁶ Watt is, however, well aware that a thorough knowledge of Clarissa's situation as it develops, even one as thorough as Anna's, does not convincingly exclude the possibility that she courted her fate, i.e. that she courted Lovelace, and more

generally that the first person narrative cannot guarantee the honesty of its sentiments. Thus, the “real nature of the story” is dependent upon Clarissa’s sentiments and aspirations. Sandra Macpherson offers a counter-model to Watt’s insistence on psychology by proposing a shift from the hermeneutics of rape to the hermeneutics of murder. Rape, she concedes, acquires a special status in the novel “reinforced by the fact that, as a crime, rape raises hermeneutic and political questions—questions, in other words, of representation—that other criminal actions do not.”³⁷ That is, the occurrence of rape is predicated upon both the mental state of the victim and how she represents that state; readings such as Watt’s depend upon Clarissa’s subjective testimony to delineate rape from courtship. But Lovelace’s status as rapist, Macpherson argues, is but the particular mechanism by which the novel assigns him to the necessary category of murderer. Invoking the contemporaneous advancement of the juristic doctrine of “felony murder,” which holds offenders responsible for the consequence of their actions regardless of their intentions, Macpherson argues that *Clarissa*’s plot is organized around this idea that actions are equivalent to responsibility.³⁸

Watt’s basis for situating meaning in identification with characters is that events provide an incomplete definition of character in Richardson’s immersive portrayal of interiority, and that the “real nature” of events is defined by the experience of their subjects. Moretti offers an advancement of this idea in his claim that the novelistic plot is marked by a “curvature towards interiority which dispenses meaning and thereby creates events.”³⁹ Despite Macpherson’s stated objective of re-reversing the character-event hierarchy in the structure of the novel, her argument is, to a certain degree, predicated on the fact of interiorly created events. Her challenge to the dominant conception of rape as the novel’s central intrigue is based on the fact that Lovelace’s fateful “courtship” of Clarissa is an inertial continuation of the novel’s preliminary suggestion of

murder. While it is not necessarily her own death that Clarissa foresees, the specter of death occasions her correspondence with Lovelace as well as the legalistic account of that correspondence—lest “anything unhappy” should occur—she provides Anna. In the aftermath of the duel between Lovelace and James Harlowe, Clarissa finds herself obliged to intervene on behalf of her family, telling Anna, “I saw plainly that to have denied myself his visits was to bring forward some desperate issue between the two, since the offense so readily given on one side was only brooked by the other out of consideration to me” (L4, 51). Thus the process of being “capable to imitate the Houyhnhnms.” [Not only does Gulliver’s master treat the supposedly identifies later, following an appearance by Lovelace at the Harlowe’s church:

I am extremely apprehensive that this worse than ghost-like appearance of his bodes some still bolder step. If he come hither (and very desirous he is of my leave to come), I am afraid there will be murder. To avoid that, if there were no other way, I would most willingly be buried alive. (L31, 142)

Macpherson is correct in that Clarissa’s sequence of actions—her entire engagement with Lovelace—is dictated by the event of murder, but not necessarily by *the* murder that occurs in the novel. Verbs such as “fear” and other subjunctive-introducing “verbs of the head,” such as “dream” or “intend” are referred to in semantics as “world creating predicates.”⁴⁰ We might say, “In the world of *Clarissa* there is a murder,” but here we see an instance of ontological rupture between the world of *Clarissa* and the world of Clarissa; the murder that occurs and the murder to which Clarissa preemptively reacts are obviously related but not identical. This gap is, in fact, a psychological phenomenon, but in instances such the above passage, Clarissa’s psychological activity—as it is transcribed in her letters—does not just illuminate for the reader her relationship to the plot structure of the novel, but generates plots of its own, sometimes convergent and sometimes divergent with that of the novel. *Clarissa* thus warrants recognition not as a possible world, but as its own proper constellation of worlds, each competing for probability.

By departing from the Lewisian model of possible worlds, a few narratologists have found more compelling ways of describing the heterogeneous nature of fictions, particularly those, such as the eighteenth-century epistolary novel, that are built upon discourse. Marie-Laure Ryan, for instance, proposes a distinction between the “narrative universe” of a text and the larger “semantic domain” of the text, which Ryan defines as “the sum of the meanings suggested by a text, the set of all the valid inferences and interpretations (I leave to others the task of determining what constitutes a valid interpretation).”⁴¹ The “actual world” of the text is, in this model, surrounded by alternate possible worlds (*APWs*), and a crucial aspect of narrativity is the opposition between actual and possible worlds. The interior worlds of *Clarissa* and Lovelace, and to a lesser extent Anna and Lovelace’s own confidant, Belford, as well as the expectations and beliefs that readers form in their engagement with them, constitute *Clarissa*’s semantic domain.⁴² The conspicuous discrepancy between the immense size of the novel and its paucity of actual events (as well as its remarkable spatial and temporal containment) marks the crucial opposition, as Ryan calls it, between semantic domain and narrative universe. The semantic domain is “larger” than the narrative universe, or “Textual Actual World” (*TAW*, the image of the world proposed by the text) because it accepts any kind of meaning, including characters’ subjective judgments, symbolic interpretations, or judgments formed by the reader.⁴³ The *TAW* of *Clarissa*, as suggested by Watt’s argument, is insufficient because its events resemble a courtship, whereas the semantic domain accommodates entities such as the “murder world” or “fear world” of the heroine. But worlds need not be as fully constituted within the text to have a meaningful function in narrative; characters’ sense of obligation, desire and fear (which I above referred to as “world creating predicates”) determine the worlds that populate the overall narrative system. Ryan explains, “The relations among the worlds of the narrative system are not static, but change from

state to state,” i.e. when a desire or fear is realized, “The plot is the trace left by the movement of these worlds within the textual universe.” As such, we can imagine “fear worlds” and “desire worlds” as having fluid positions on the “board” of the textual universe, with the plot emerging out of the conflict of characters’ respective worlds relative to what is or will become actual (the spatial metaphor that is used in logic puts the actual world at the “center” of all possible worlds, accordingly Ryan refers to the center of the board).

Plot then takes the form of a “war of the worlds,” as Ryan describes a “knotting” of the domains belonging to and shared among characters, out of which they subsequently plot their own disentanglement. Richardson’s *Pamela* is explicit about the relationship between the novel’s plot and the plotting of its characters. After seizing Pamela’s letters, Mr. B. remarks, “There is such a pretty air of romance, as you tell your story, in *your* plots, and *my* plots, that I shall be better directed how to wind up the catastrophe of the pretty novel.”⁴⁴ The metaphor of worlds to describe different characters’ mental activities, especially intentions, is common in discussion of Richardson’s form. Watt, for instance, credits Richardson for safeguarding against the potential boredom of his narrative in *Clarissa* by creating a “contrast between the totally different worlds of the male and female correspondences,”⁴⁵ while Thomas Keymer describes how, through the consistent shifting between the different correspondences, “the novel’s universe becomes a multifarious plural.” Thus Keymer sees in Richardson’s use of the epistolary form a lack of insistence on a privileged reality: “In its very organization the narrative is in conflict with itself, with results so discordant that at times one is driven to think not of competing versions of an identical reality, but of reality’s displacement by the force of competing fictions.”⁴⁶ Richardson dramatizes this by populating *Pamela* with different characters’ competing versions of Pamela’s own story even as Pamela produces the authoritative and authentic account that we read.

Keymer's restraint is warranted; there is ultimately a singular reality to which the novel refers, but this does not preclude the presence of competing fictions. In thinking of *Clarissa* as a constellation of possible worlds, we can assume a classically experimental approach to the question of probability, where what is probable appears as the most likely outcome of the trial, i.e. the action beginning with the quarrel of Lovelace and James Harlowe. Lovelace is then both the engine of the plot and a reader figure, making updated inferences as the trial reaches new stages.

The threat of murder, as I above argued, is the condition that informs Clarissa's creation of an intent world, in which she will sacrifice herself to prevent violence and thus obliges Lovelace's interest. "And will you, will you thus ungenerously, sir, take advantage of my fears!—of my wishes to prevent mischief?" she beseeches him shortly before her abduction. Her characterization is of course correct, as he has calculated his advantage, his desire world, to coincide with her fear world. Thus, the abduction is achieved by cultivating in Clarissa's imagination elements of this fear world, in which violence is imminent, and directs her action by populating it with false figures and choices. "Your brother!—your uncles! or this Solmes!—they will instantly burst the door!—Fly, my dearest life!... if you would not see two or three murders committed at your feet, fly, fly, I beseech you!" In the narration that follows, Clarissa presents a detailed portrait of this adrenaline-fueled competition between fiction and reality and the ultimate victory of the former:

Now behind me, now before me, now on this side, now on that, turned I my affrighted face in the fame moment; expecting a furious brother here, armed servants there, an enraged sister screaming and a father armed with terror in his countenance, more dreadful than even the drawn sword which I saw or those I apprehended. I ran as fast as he, yet knew not that I ran; my fears at the same time that they took all power of thinking from me adding wings to my feet: my fears, which probably would not have suffered me to know what court to take, had I not had him to urge and draw me after him: especially as I

beheld a man, who must have come out of the door, keeping us in his eye, running backward and forward, beckoning and calling to others, whom I supposed *he* saw, although the turning of the wall hindered *me* from seeing them; and whom I imagined to be my brother my father and their servants. (L94, 379)

In relaying this event, Clarissa knows she has been subjected to a plot, and thus recreates a portrait of her consciousness in the moment to elucidate her present “shame.” Her voice, she tells Anna, was “contradicting her action” as she cried “No, no, no” while being led into a chariot. It is important to note that this vivid recollection is offered in the service of self-exculpation, in keeping with the novel’s general premise of Clarissa’s history as justification. This episode is perhaps Richardson’s most direct employment of competing fictions, as he counters Clarissa’s perspective of the abduction with series of letters from Lovelace to his accomplice Joseph Leman (the running and beckoning man) and his confidant Belford, in the former providing directions for the operation and in the latter gloating over his masterful execution. Clarissa’s insistence on her voice, that is, her mind contradicting her action is a fairly concise distillation of Watt’s reasoning for locating meaning outside of events. The “real nature” of Clarissa’s elopement with Lovelace, like any instance of rape, is predicated upon her mental orientation to the event, her mind’s contradiction to it. But explicit in Clarissa’s account and Richardson’s revelation of Lovelace’s plotting is a conflict of possible worlds, with one of them verified by the text as actual. As John Richetti notes in his reading of the episode that, to this point, Clarissa’s style has consciously avoided self-dramatization and has instead opted towards rational meditation (while it is Lovelace who often portrays himself as a player in a predetermined drama). In this case, it appears Lovelace has “tricked her into entering a world of action and movement.”⁴⁷ Indeed, Clarissa must adjust her world to contend with the one that Lovelace has hostilely imposed upon her in moving *his* desire world to the center of the board.

Lovelace's victory inevitably leads to a further "knotting" of worlds that must be worked towards further resolution, thus describing the novel's plot as Lovelace's conquering of Clarissa is no more satisfying than calling it a courtship. As the psychological reading insists, the novel declares the triumph of the individual over social forms as they are dictated by outside observers, and thus Clarissa is able to maintain virtue in violation. "When Lovelace's intention does not get translated into [her] consent, his rape of her is rendered perpetually incomplete," Frances Ferguson claims.⁴⁸ While he is able to align the events of the actual world with his desire world, he is not simultaneously able to bring Clarissa's constellation of worlds into this alignment. Even her death, Watt contends, is presented by Richardson to have "all the appearance of an act of the will,"⁴⁹ such that Lovelace's carnal "code" is never able to defeat Clarissa's spiritual one. The appearance of willfulness acquires profundity not so much in its opposition to the fact of her pseudo-murder by Lovelace as to the "imperative" of her death in the tragic structure of the novel.

Clarissa abounds in probable, accurate foreknowledge on the part of its characters that cannot help but be assumed by the reader. This foreknowledge, even more than the paucity of narrative events, substantiates Dr. Johnson's warning against reading for plot. Perhaps the second most widely quoted eighteenth-century reaction to *Clarissa* is the moment of terror recounted by Diderot in his *Eloge de Richardson*: "Don't believe him! He's deceiving you! If you go, you'll be ruined!"⁵⁰ Diderot's involuntary warning to Clarissa takes the form of a counterfactual prediction of the sort that Hume would axiomatically reject were it to refer to an actual world event. Diderot is proven correct, however, because the inferential structure of *Clarissa*, what Patey would refer to as its system of probable signs, is stronger than any that might actually exist. Richardson, by populating the world of the fiction with signs and importing

many from the repository of literary history (e.g. Lovelace's resemblance to Milton's Satan, or the subversive echo of the plot of *Pamela*), removes much of the aleatory uncertainty that attends considerations of what philosophers in the Leinizian/Lewisian tradition call the closeness of possible worlds. The set of factors and variables that should determine closeness in actual world considerations are historically difficult to agree on (think of how the calculations of Swift's Lagadans leave them in perpetual fear of the sun's destruction), but for Richardson the laws of the world are prescribed by the information contained in the narrative and other narratives of its genre.

At the outset of the novel, Lovelace has just partially seduced and then neglected Clarissa's sister, to the disgrace of the Harlowe family. His reputation as a libertine precedes him, as Anna warns Clarissa, cultivating what Umberto Eco calls a "model reader."⁵¹ We might then say that Lovelace's identity as tragic villain is a function of genre, encoded in the fabric of the textual world as non-autonomous entity. But within the *TAW*—albeit after Clarissa has already left her home with him—Richardson does suggest the set of worlds that are closest to that which will become Clarissa's. "Ask him after Miss Betterton and what became of her, and if he prevaricate, question him about Miss Lockyear—Oh my dear, the man's a villain!" (L177, 576) Anna warns her, referring to floating accusations of rape surrounding Lovelace, at least one of which—Miss Betterton—resulted in her death during childbirth (L139, 494). The impending and imperative sense that Clarissa will undergo ruin and death is what Eco calls an "inferential walk," in which "the reader is led to make an *extensional* operation: he considers the various macropropositions as statements taking place in a still-bracketed possible world."⁵² As such, every step of reading, even at the level of the sentence, marks the opening and closing of possibility. If we consider *Clarissa* to be a closed text, insofar as we are not courted to wonder

either what actually occurred in the text or what might occur beyond the narrative we have been given, its structure can be described as a restrictive movement from inferred possibilities to semantic disclosure, that is, the actualization of certain propositions to the exclusion of others.

Eco's model of the novel is especially suited to epistolarity to the degree that it almost exactly encapsulates Robert Stalnaker's model of "possible worlds semantics," in which conversation functions much like the progression of a novelistic plot, from a set of inferences to the establishment of a narrower actuality. "To engage in conversation," Stalnaker tells us, "is, essentially, to distinguish among alternative possible ways things might be. The purpose of expressing propositions is to make such distinctions. Presuppositions define the limits of the set of alternative possibilities among which speakers intend their expressions or propositions to distinguish."⁵³ Stalnaker understands presuppositions as a set of possible worlds, or the set of "live options" relevant to the conversation. Every utterance in the exchange leads to a more exact identification of what reality is. Such an understanding translates nicely to the epistolary novel, as we have seen how the various sets of correspondences interact with and counteract one another towards the establishment of a singular narrative. The same might be said of any progressive narrative, but in the epistolary novel the hierarchy of the possible and the probable can be mapped directly onto the conflicts of characters. Indeed, Lovelace often demonstrates awareness of his own limiting of Clarissa's live options, as he writes to Belford following a rebuke for his first attempted rape:

Suffice it at present to tell thee, in the first place, that *she is determined never to be my wife*—to be sure, there ought to be no compulsion in so material a case. Compulsion was her parents' fault, which I have censured so severely that I shall hardly be guilty of the same. And I am glad to know her mind as to this essential point.

I have *ruined* her, she says!—Now that's a fib, take it in her own way—If I had, she would not perhaps have run away from me.

She is *thrown upon the wide world*: Now I own that Hampstead Heath affords very pretty, and very *extensive* prospects; but 'tis not the *wide world* neither: and suppose *that* to be her grievance, I hope soon to restore her to a *narrower*. (L231, 760)

Lovelace's violence follows this pattern of narrowing; as he continues to close off her future prospects until she expires. The accentuated tragedy of *Clarissa* is accomplished via the reader's privileged position in making probable inferences established in contradiction to Clarissa's relatively poor ability to do the same. So, where critics have traditionally conceived of an essential conflict between the interior experience of the individual and the form of the plot, we might more comprehensively describe a conflict between the imperative narrowing enacted by Richardson (via Lovelace) and the "wider" set of possibilities imagined and intended by his heroine. Predominantly spoken of as a large body of ideas and sentiments surrounding (or hanging off of) a thin skeleton of narrative, *Clarissa* resembles nothing so much as Leibniz's pyramid, extending indefinitely while defined by a singular point.⁵⁴

Clarissa demonstrates the capacity for literary probability to be generated out of an understanding of itself as such. The plot of that novel is altered by characters' assessments of what is likely to happen and what appears to be happening according to differing canons of probability. This development can be explained by a turn in novelistic intrigue towards social conflict, such that Gerard Genette defines novelistic verisimilitude as "a body of maxims and presuppositions that constitutes, simultaneously, a vision of the world and a system of values."⁵⁵ But it is not simply the case that the values of *Clarissa*'s world prescribe the sorts of actions that may occur within it, rather, the sense of that prescription shapes both the action and the reader's response to it. The reflexive nature of probability is lost in critical assessments that treat the development of the eighteenth-century novel in terms of a movement from lower to higher degrees of frequentist probability, for instance, Brian Richardson's claim that "in the eighteenth

century, the balance shifted from the extraordinary to more diurnal notions of probability.”⁵⁶ The framing of probability as a higher degree of possibility is famously put forth by Fielding in the authorial aside that begins Book VIII of *Tom Jones* (1749), where he insists that “possibility alone” is “not sufficient to justify [poets]; we must likewise keep within the rules of probability.”⁵⁷ This injunction (a version of which appears in *Joseph Andrews*, discussed below), combined with Fielding’s explicit undercutting of the formal verisimilitudes of Defoe and Richardson, has positioned Fielding as the first novelist to define the genre of the novel according to probability.⁵⁸ The reader of *Tom Jones* certainly enters a world defined by an economy of agential and spatial relationships (where *anything* cannot happen), but also one that abounds in coincidences and sudden twists, and, more importantly, one that upends many of the probabilistic inferences it invites, that, for instance that a character named Squire Allworthy will be an image of rectitude and benevolence.⁵⁹ If there is a new novelistic probability that characterizes the genre from the mid-eighteenth century onward, it is not a precondition of narrative but an idea taken up and responded to by narrative.

The Pleasures of Mathematical Abstraction

One model of probability that could better account for the vicissitudes of eighteenth-century novelistic plots is the contemporaneous theorem of Thomas Bayes, presented in *An Essay towards solving a Problem in the Doctrine of Chances* (1763). The achievement of Bayesian probability, like that of the Port-Royal *Logic*, is immense but largely intuitive. Bayesian probability simply entails the updating of expected events and outcomes according to successive developments and revealed information.⁶⁰ In proposing a Bayesian model for narratology, Karin Kukkonen references the standard set of potboilers and detective narratives,

but focuses on Burney's *Evelina* (and later novels of its ilk, notably *Emma*) as an ideal instance of Bayesian probability, for its plot continuously turns on instances of reevaluation. The set of possible developments or outcomes for a given scenario is referred to as a "Bayesian net," but this net is more susceptible to reconfiguration and updating than "world"-based canons of probability of the sort proposed by Culler and others. Bayesian nets retract and regenerate, so to speak, according to observations at the most local levels. Pope's diagnosis of the "sure returns of still expected rhymes/ Where'er you find *the cooling western breeze*,/ In the next line, it *whispers through the trees*" for instance, is a characteristically Bayesian inference at the sentence level.⁶¹ At the level of narrative, Bayesian inference inevitably consists of reasoning likely effects from causes. Genette argues that the typological consistency of causes and effects is the basis of verisimilitude, and proposes that narratives either rely on the reader's implicit or cultural sense of probability, called *vraisemblance* (equivalent to Abrams's/ Patey's external probability), the specific motivations of actors in specific situations, called motivated narrative, or, most intriguingly, the defiance of expectations, called arbitrary narrative.⁶² Michael Riffatere offers a critique of this model on the grounds that the arbitrary can itself be a motivation or a generic or cultural norm.⁶³ This amounts to recognizing that any novel susceptible to modeling through Bayesian inference is likely to make sport of probability, or that self-identified probable novels like *Tom Jones* partake in the impulses of the anti-novel. The supposed form of the novel is its own probability engine that may counter external judgments but cannot subvert itself.

If the unreliability of certain inferences is merely a joke in *Tom Jones*, the unreliability of all inference whatsoever is the unifying principle of Sterne's *Tristram Shandy*. Bender characterizes the latter work as an implicit commentary on the inchoate association between probability and novelistic fiction: "Sterne is purposefully dealing in the everyday world where

fact is stranger than hypothesis or fiction. Sterne's is the world of the 'possible,' a terrain that Fielding tried to forbid novelists," though as we have seen, this is a terrain more rhetorically than actually forbidden.⁶⁴ *Clarissa* is an apotheosis of probability, expressed as inferable outcomes, arising out of possibility via an extreme process of limitation; *Tristram Shandy* is a different sort of limit case in the novel's development. Sterne's narrative is structured by events that are identified explicitly as the product of long chains of contingency that are thus uninferable. Because of its already outmoded attention to representing its events as though they actually occurred, *Tristram Shandy*'s place in the history of the novel is rather difficult to assign, as its importance to the form is both self-evident and lacking proper evidence. Without being able to offer any definitive, allusive proof that Sterne had read *Clarissa*, among other major works of the 1740s and 50s, Keymer has only recently compiled sufficient evidence that he was engaged with the form's evolution, and that *Tristram Shandy* is indeed consciously situated within the novel's developmental arc.⁶⁵ Though approaching the problem from an opposite side, Sterne warrants reading alongside Richardson for his shared rejection of Lockean or Humean probability as a model for fictional composition. Of course, Tristram in his capacity as narrator explicitly endorses Locke's *Essay* as a model, but this endorsement amounts essentially to a pastiche of naïve empiricism as conceived of earlier in the century. Sterne ironically attempts what Watt calls "the ultimate realist premise of a one-to-one correspondence between literature and reality," a version of realism that is, like its counterpart, Fielding's probabilism, is more rhetorically stressed than honestly attempted.⁶⁶ Tristram's project includes both a verisimilitude of presentation on par with Richardson's written-to-the-moment documents, and a scrupulous attention to causalities both physical and mental, so that no event is not suspended in a web of explanation, however apparently improbable. *Tristram Shandy* is, among many things, a

demonstration of the unwieldiness inherent to the replication of external standards of probability within a coherent narrative form.

There are several aspects of Sterne's novel that suggest, in parallel with Fielding, a broadly parodic engagement with Richardson. Like *Clarissa*, *Tristram Shandy*'s conspicuous length is addressed and defended according to its valuation of mental action at a level equivalent or superior to that of event, as Tristram alerts his reader, "You must have a little patience. I have undertaken, you see, to write not only my life, but my opinions also; hoping and expecting that your knowledge of my character, and of what kind of a mortal I am, by the one, would give you a better relish for the other."⁶⁷ The similarly framed projects of *Clarissa* and *Tristram Shandy* diverge insofar as the latter proposes only a relationship of mutual relish between life and opinion, where the former would have opinion take the place of action. In the Shandean universe, both events and opinions (or other mental or emotional phenomena) exist in a wide causal network, and Tristram's assumed task as writer is to identify the specific causal chains by which certain actions and sentiments have generated one another in succession, especially because these chains fall so far outside the realm of the necessary or probable. Thus Sterne shares with Richardson an interest in tragic contingency, only, as Bender observes, in order to illustrate that the domain of the possible is so large and unwieldy as to nullify the value of probable inferences:

You may raise a system to account for the loss of my nose by marriage-articles,—and shew the world how it could happen, that I should have the misfortune to be called Tristram, in opposition to my father's hypothesis, and the wish of the whole family, Godfathers and Godmothers not excepted.—These, with fifty other points left yet unravelled, you may endeavour to solve if you have time;—but I tell you beforehand it will be in vain...(I.180)

Sterne proposes that the reader enter and remain suspended in the state of surprise that typically prefigures—as in the case of Crusoe's barley—the application of Bayesian probability to delimit a narrower than infinite net of potential inferences.

Tristram Shandy further broadens the confines of credibility by insisting on a biographic rather than action-oriented framework. That is to say, Tristram as speaker embraces instances of the improbable (as in the mutilation of his nose and his accidental circumcision occurring at the end of long chains of contingency) as a basis of verisimilitude and does not delimit potential events according to any criteria of poetic significance, only according to their having occurred. The immensity of this project accounts for the recurring comic motif of representational difficulty throughout the work: instances in which Tristram either must apologize for the failure of his writing to neatly balance action across four dimensions, or laments the impossibility of writing his life and opinions to any degree of completeness. The work does not, however, portray only this unwieldiness, but contains within itself a shadow-work of ideal narrative probability in the form of Tristram's Uncle Toby's recreation of military sieges. Obsessed with a species of real, historical event that is governed by nearly transparent laws of probability, Uncle Toby appears as a template for the ideal novelist. We can abstract from Toby's non-literary project a kind of representational ethos in which the satisfaction of watching an intelligible narrative unfold is more valuable than capturing the full complexity of lived experience. This vision of the novel as a medium through which objects and events are made intelligible is articulated through a conversation between the formalization of narrative fiction and the systemization of knowledge across the eighteenth century.⁶⁸

Critical accounts of *Tristram Shandy*'s standing relative to the genre have recognized Tristram's difficulty as an ironizing of the potential for either biological and intellectual life, or scrupulously accurate renderings of physical causality, to serve as bases for novelistic probability. Tristram's narration is not, however, the only representational project occurring in the world of the novel. His father Walter suffers in a nearly parallel fashion as he too attempts to

derive intelligibility from amidst so much contingency. A perpetual generator of maxims and an aspiring encyclopedist, Walter Shandy attempts in vain to “raise a system” that would contain the variabilities of experience into universal wisdoms. Most famously, his *Tristra-paedia*, a guide to child-rearing, is rendered moot by every passing day of his son’s life. Tristram’s Uncle Toby warrants attention then, because his representational project—recreating every major European siege from the Nine Years War (1688-1697) through the peace of Utrecht (1713)—is both completed and consistently generative of solace and pleasure. Toby’s choice of subject, the siege, and his mode of representation, scale recreation, enable a combination of facticity and intelligibility that evade the other Shandys. Toby’s project, I argue, presents itself as a viable countermodel to the untenability of Tristram’s version of novelistic probability (which is to say credibility rather than, or at the expense of typicality) in its translation of external, mathematical probability into coherent and consistent narrative.

Toby Shandy appears within Sterne’s novel and in criticism as an emblem for the representational difficulty of portraying contingency. As Jonathan Lamb explains, “Tristram cannot begin to attempt his uncle’s character without breaching the unities of time and place. If we are to know how Toby acquired his modesty (for Tristram insists it is not innate), then we have to understand how the harm caused in 1694 by a French barrage against a fortified town in Flanders bears on the hurt inflicted twenty years later by a shot from Mrs. Wadman’s eye, leveled in an English garden at a gentleman’s crotch.”⁶⁹ The event of the wound contains its own extended causal chain, even if distilled to few seconds of action, as Tristram narrates (implicitly reciting Toby’s own account) that, “it was owing to a blow from a stone, broke off by a ball from the parapet of a horn-work at the siege of Namur, which struck full upon my uncle Toby’s groin.”

The simple, probable event of a soldier injured in war, in Shandean narration, becomes an aleatory event of diverse physical objects meeting along separate trajectories in spacetime.

Toby's physical handicap has become, at the moment of his first appearance in Tristram's narration, a representational crisis. To the guests that Walter brings to his bedside, Toby can account for himself and his wound in no way but by reproducing for them a precise spatial understanding of the fateful siege. For twentieth- and twenty-first century readers, a natural inclination has been to understand this penchant for self-abstraction as arising specifically from the trauma of warfare.⁷⁰ While this reading is certainly warranted, Toby's difficulty speaks to more than the pathology of warfare, namely, to the pitfalls of attempting to conjure events accurately in verbal narration. As Tristram explains, the combination of his visitors' unfamiliarity with the terminology of the military arts and the particular density of physical detail Toby must account for causes "sharp paroxysms and exacerbations of his wound," prompting a turn to visual or graphic representation over verbal narration in the form of an attempt to acquire a map so that he might "stick a pin upon the identical spot of ground where he was standing when the stone struck him (I.96)."

Though Toby emerges a sort of mock-romantic hero, where his "hobby-horse" of military diagram is concerned, he appears to vacillate in the narrow domain between the tragicomic and the tragic. Unable to integrate his mind or his speech to his surroundings, Toby is doomed to hinder the promised progressiveness of Tristram's narration. If taken as a representative (and belated) figure for the physico-mathematical revolution of the seventeenth century, Toby's maladroitness could signal Sterne's bracketing of scientific theory and culture from the practice of novel writing. Ala Ayyes sees Toby as akin to Swift's Laputans, his military science obsession signifying "Sterne's realization of the mismatch between the mathematical nature (and

rhetoric) of the new science and the vulnerable flesh of human beings.”⁷² “Sterne’s universe is strange,” Alryyes argues “because his novel meshes the moral and the physical realms and returns human beings to scientific orders built upon excluding them.”⁷³ The universe of *Tristram Shandy* is explicitly mechanical, such that human characters exist in material contiguity with the objects with which they partake in causal chains, for instance the leaden weights that Corporal Trim removes from the window to use as model canons, which cause the sash window to fall and wound Tristram. But while Tristram narrates with conscious difficulty the process by which his own groin was wounded, Toby would find the perfect calculation to represent himself in relation to the stone, the parapet, the canon ball and the canon (as well as the precisely choreographed battlefield around them). As the ultimate distillation of mathematical and scientific progress, ballistics represents the possibility of total relationality that Toby wishes to narrow down, and thus he turns to the study of fortification and the reenactment of sieges.

Toby’s “campaigns,” proceed from the Battle of Namur until the effective end of the age of siege warfare on the European continent. Diegetically, the project is essential to the history of Tristram’s mutilation, and brings him and Trim into contact with the widow Wadman and her handmaiden Bridget, initiating the novel’s only true romance plot. More importantly, however, the project succeeds diegetically in providing Toby with the solace and comfort that had otherwise eluded him, as evidence by the fact that the vast majority of the novel’s instances of “pleasure” occur in reference to Toby’s bowling green. The project achieves completion according to its own standards (which are determined by real external events) and this coincides with the conclusion of Sterne’s novel, which ironizes its own apparent incompleteness. Toby’s status as a hero of representation, however, has only recently been explored. In tracing Toby’s influence on Ernst Jünger’s narration of his experiences in World War II, Jonathan Lamb marks

the salient feature of Toby's representational practice as a turn from first person verbal narration to maps, diagrams and quantitative data.⁷⁷ This kind of supplementation—suited to the representational challenges posed by events that occur at a scale far surpassing individual consciousness while taxing consciousness to the point of unreliability—is contextualized by Lamb as an evolutionary development from the empirically-oriented realism of the early eighteenth century.

The form of the fortress entails an ideal narrative of its attack, such that Toby is both an amateur master of fortifications and of siege engineering. If the particulars of the second battle of Namur⁸⁰ bear little on *Tristram Shandy*, the formal guidelines of seventeenth- and eighteenth-century siege warfare are an intriguing foil to the novel's formal experimentation and fixation on contingency. A defining quality of siege warfare that is lost on the modern reader is its probabilistic regularity, which is to say its general adherence to frequentist projections. In the first siege, the fortress at Namur was seized by Sébastien Le Prestre de Vauban, Louis XIV's highest ranking general and the most respected military figure on the European continent, whose regard would later be rivaled only by Toby's hero, the Duke of Marlborough. One modern historian describes the choreography of a Vauban siege as "immaculately staged and timed," such that defenders could know well beforehand whether the siege was mathematically certain to succeed and surrender.⁸¹ This sanitary account of seventeenth-century siege warfare does not negate the trauma of soldier like Toby, much less minimize the cost of violence, but does invite us, however, to extend the potential for delight outward from the fortifications to the entire narrative event of the siege. A siege, especially one of the sort conducted by a historically proficient tactician, is a suspended event, in which warfare is concentrated into a single spatio-temporal arena governed by complex but manifest networks of decisions generating tables of

probability known to all sides. A siege is pleasurable to the degree that it is bounded and therefore uniquely knowable.

Tristram's narration cannot order its world intelligibly because it grants that the characters and objects within that world exist, not only inside, but also outside of the relations he is able to draw. The bowling green, by contrast, is a space that, though referring to an external reality, remains identical to itself, and enables a balance of internal and external probabilities.

We know, for instance, that Toby and Trim staged the attacks of hundreds of towns, but are content to ignore the specific identity of "towns" as such, and instead to make use of a set of representative buildings arrangeable so as to convey the idea of any given town:

—It answered prodigiously the next summer—the town was a perfect Proteus—It was Landen, and Trerebach, and Santvliet, and Drusen, and Hagenau,—and then it was Ostend and Menin, and Aeth and Dendermond.

—Surely never did any Town act so many parts, since Sodom and Gomorrah, as my uncle Toby's town did (II.540).

Toby's flexibility of reference calls to mind Fielding's casual manifesto of verisimilitude in *Joseph Andrews* (1742), in which he insists that his lawyer character is "not only alive, but hath been so these four thousand years" and has not "confined himself to one profession, one religion, or one country."⁸³ In addition to reducing the realm of the possible to the narrow confines of the probable in the form of the siege, Toby's practice enables the substitution of specificity, which accounts for much of the burden of Tristram's version of naïve empiricism, for a common sense recognizability. Each town is able to undergo a quantum vacillation between its external, historical existence and its functional identity within the form of the siege.⁸⁴

Where neither Tristram nor Walter could ever "raise a system" to account for the series of accidents that would define their lives, Toby is indeed firmly reasonable in believing that the outcome of battles—and their attending injuries and deaths—can be accounted for by simply

understanding coordinates, angles, and elevations. And in this sense, it hardly matters that he and Trim recreate events that have already happened, for, given the Duke of Marlborough's impressive record and Toby's own mathematical acumen, he could well have "finished" the war by his own calculations. That is to say, the siege, unlike say, the life of a man, is a form that is knowable before it is specifically known; the fact that probable outcomes do not always come to pass affirms the importance of contingency without necessarily inviting chaotic skepticism. It is furthermore important to note that fortifications and sieges do not necessarily stand in for the totality of military science. If Toby is anywhere deluded about the art of war, it is in his in his passion for sieges at the exclusion of open-terrain battles, which, as Anders Engberg-Pederson notes, were in fact more numerous in the campaigns he reenacts, and all but extinct by the time of composition of *Tristram Shandy*. In resisting this shift in the culture of war, Toby is consciously preserving the form of narrative probability that the narrative around him eschews.⁸⁵

Within the world of *Tristram Shandy* then, Toby embodies the diminishing if not fully defunct spirit of seventeenth-century positivism. As all the Shandy men are wounded or else undone by unforeseeable contingencies that should propound Humean skepticism, Toby's quasi-virtual reality is contained enough that action is sufficiently scientific to be the object of real knowledge. As Engberg-Pederson argues, in the studies of Vauban, warfare "appears as the calculable product of a series of graphic operations, as the function of a fundamentally knowable and immutable geometrical order."⁸⁶ Fortification and siege engineering are likewise singled out by Hobbes in the *Leviathan* as pure distillations of the geometric method and thus a kind of proof of the immanence of power.⁸⁷ In Defoe's *Essay Upon Projects*, whose publication nearly coincides with Toby's military career, siege-craft is lauded as the ultimate evidence for the cause of the Moderns, for it marks the "highest perfection of human knowledge."⁸⁸ Defoe references

the sieges of King William's campaigns in Flanders explicitly as events whose technical advancement renders them exceptionally probable. Speaking of wagers, he argues:

It is visible by experience, not one town in ten is besieged but it is taken. The art of war is so improved, and our generals are so wary, that an army seldom attempts a siege, but when they are almost sure to go on with it; and no town can hold out if a relief cannot be had from abroad.⁸⁹

Here, the siege is presented as the absolute negative limit of the aleatory. Were anyone to take bets on the result of a siege, he could not fail to profit by adjusting the terms of wager according to developments in the siege. "This is gaming by rule," he explains, "and in such a knot it is impossible to lose."

Toby's siege-works are thus bastions of probabilism in a world where the mathematical progress of the late seventeenth-century appears to be of less and less everyday significance. In his "Sermon on Time and Chance," often taken as a kind of thesis statement for *Tristram Shandy*, Sterne presents human life as "a series of contingencies equally improbable," arguing that this is itself evidence of divine providence, a counterintuitive argument that, as Patey glosses, rests on an understanding of chance "not as the unpredictable or uncaused but as that which issues from mechanical, *nonintelligent* causes."⁹⁰ The question facing Sterne's fiction then, is whether the metaphysical conditions of this world are those that should or must adhere in the world of the novel in a relationship of replication. For Patey, the sermon and its theological argument from improbable signs can be translated into an anti-probabilist agenda for Sterne's fiction. In *Tristram Shandy*, he argues, "Sterne takes positive pleasure in frustrating and overwhelming probable judgement," and accordingly satirizes the "narrative procedure" of Fielding's novels.⁹¹ The portrayal of *Tristram Shandy* and ultimately of Sterne himself as skeptical of Fieldingesque novelistic realism inevitably depends on locating the novel's normative model of representation in Tristram's narration and his meditations upon it. Speaking

of the famed lines of digression, which graphically and pseudo-mathematically map the course of the novel, Engberg-Pederson sees Tristram as offering a definitive parody of Toby's scientific imagination: "Sterne thus inverts the epistemology of the science of fortification, fashioning contingency out of order."⁹² The explicit critique of frequentist probability in *Tristram Shandy* may, however, be the best argument for its necessity to the novel form in Sterne's estimation. The alternative is, after all, a naïve realism futilely striving to capture in words an infinite net of contingent objects and events, courting only surprise while denying catharsis, with no hope of reaching an end. We might instead find evidence of Sterne's endorsement of probable narratives in the "infinite delight" of Toby's siege-works.

Conclusion: The Aestheticization of Probability

In shifting analysis in this chapter from works that directly address questions of science to works that do so only obliquely, or not at all, I have sought to illustrate an oft-made elision in the concept of probability that is somewhat undertheorized.⁹³ Where once the probability of fiction referred, generally, to its capacity to be believed, in the mature novel probability comes to be understood as a kind of self-referential likelihood or frequentism. This distinction, on one level, overlaps with that of external and internal. But internal probability, as we have seen, is conceived of by Locke and others as a quality of testimony that renders it worthy of being credited. So, *The Castle of Otranto* may be read as a believable or even accurate account of how people might behave in reaction to supernatural events, just as Kepler's moon voyage courts belief while portraying events that no reader could believe really occurred. The cases of *Clarissa* and *Tristram Shandy* are different, as their notions of probability are not bound to the criterion of credibility, but simply predictive accuracy. One might say that *Clarissa* is a more likely story

than *Pamela* according to external standards, but within the novel, probability is a function of the mechanics of plot. The believability of *Clarissa* is established externally, by its presentation of characters in a situation that is very much possible in the real world. Its internal probability does not so much bolster this credibility as generate a certain reading experience. This is the kind of experience sought by Toby Shandy, who is not interested in telling a maximally credible story about war, but rather a satisfying one. In these instances, probability is not a quality of representation that serves an epistemological purpose, but an imported epistemology that provides a quality or texture to the aesthetic experience of representation.

The confines of the credible might then be understood to refer more to possibility than probability. Gallagher is fairly accurate in her generalization that mid- to late-eighteenth-century fiction is dominated by narratives that (in analytic-narratological language) take place in possible worlds that are “close” to the actual one, and we might align this possibility with external probability. But how might we characterize the significance of probability *within* fiction? The example of Toby Shandy’s bowling green is illuminating as it is a physically delineated space where meaningful laws of probability adhere within a generally unknowable universe. As Sterne recognizes, the creations of human science, in this instance the nearly perfected practice of siegecraft, are susceptible to probabilistic analysis of a generally predictive sense, while the actual world is not.

Sterne, as a clergyman, attributes the failure of predictive systems to the permanent action of providence, and, as a student of enlightenment science, attributes this failure to the natural limitations of mathematical models relative to themselves. Had Toby Shandy read Newton, he may have had an easier time calculating the course of a cannonball towards his groin in a vacuum, but he would also be familiar with the three body problem, which serves to this day

as an example of the limits of calculation. The problem, very broadly, is that after a certain degree of contingency is introduced (in Newton's case this would be adding the moon into calculations of the earth's rotation around the sun, or adding the sun into calculations of the moon's rotation around the earth), a model fails to keep up with the reality it is intended to describe. One hundred years after probability took on its modern, generally frequentist meaning, and emerged as a concept that could render the natural world more intelligible, Sterne suggests that this form of probability may be somewhat of a tautology. Out of the entirety of the natural world, only things that are probabilistic are susceptible to the descriptive potential of probability.⁹⁴ Probability may be wielded in the pursuit of credibility, but it may also be understood as an optional feature of the game of representation.

Notes

¹ As I have argued at various points in the first three chapters, the legitimation of experimental science is persistently enacted through its rhetorical opposition with fiction across the seventeenth century, but in actual practice fiction remains a valuable form of evidence, a fact recognized implicitly by Locke and explicitly by Hume. The ambiguity is present in Sprat's *History of the Royal Society*, in which Sprat champions modern over ancient natural history by stressing that the latter is but "romance" rather than "true history," while admitting that ancient fables contain a measure of truth. As Bender argues, the promotion of induction within the Royal Society and especially in the works of Newton are intended to distance proper science from the structure of the hypothesis, which is insufficiently distinguishable from fiction. It is ultimately in the elucidation of a particularly novelistic probability that Bender sees a potentially permanent disambiguation between scientific hypothesis and literary fiction: "The probable is the ground where scientific hypothesis meets fictionality; the probable is the point around which science and the novel rotate in complementary orbit, the meeting point at which fact can, apparently, be separated from fiction." It is

eighteenth-century fiction writers, then, who shift the course of fiction from parallel to dialectically complementary to science. See Bender, "Enlightenment Fiction" 17

² An indicative and highly influential articulation of this account can be found in M.H. Abrams, *The Mirror and the Lamp: Romantic Theory and the Critical Tradition* (New York: Oxford University Press, 1953) 271-284. Patey groups Abrams within a tradition of Romantic criticism beginning with Coleridge, and, while adopting the terms internal and external for his own analysis, insists that "to mistake poetic probability with internal consistency is to mistake these critics' full meaning." As he explains, the logic of this Romantic claim to probability depends on a poetic access to nature. See Patey 142-144. Addressing the novel more specifically, McKeon characterizes this shift as a movement from naïve empiricism to realism, which, by contrast "exists to concede the accountability of art to a prior reality, without seeming to compromise the uniquely modern belief that such reality as it is answerable to already is internalized in art itself as a demystified species of spirituality." See McKeon 120. In all these accounts then, a fictional world is not just another world, but a probable-in-some-way representation of *the* world.

³ Catherine Gallagher, "The Rise of Fictionality," *The Novel, Vol. 1* ed. Franco Moretti (Princeton: Princeton University Press, 2006) 337-339

⁴ Gallagher's confinement appears a passive and externalized version of Coleridge's active and internalized "willing suspension of disbelief," addressed below. The form of probabilism that Gallagher associates with the "discovery of fiction" also appears to describe a similar movement as what McKeon identifies as that between naïve empiricism and realism. McKeon's account differs in its attention not merely to the binary of incredible and credible, but also that of material and ideal. See McKeon 1201-121

⁵ Samuel Taylor Coleridge, *Samuel Taylor Coleridge: The Major Works* ed. H.J. Jackson (New York: Oxford University Press, 2008) 314

⁶ Frances Burney, *Evelina* (New York: Oxford University Press, 2002) 10

⁷ Walpole, *The Castle of Otranto* 60

⁸ In *Structuralist Poetics*, Jonathan Culler describes five hierarchical levels of verisimilitude (1) the real world; (2) cultural norms; (3) generic norms; (4) texts reflecting on their own conventions; (5) parody. These levels, Culler argues, provide "possibilities of meaning, ways of naturalising the text and giving it a place in the world which our culture defines." This account is later taken up by Monica Fludernik, who aims to provide some historical texture to Culler's general idea of "naturalization." Karin Kukkonen, invoking Wolfgang Iser, resists these models of verisimilitude as structure-matching in favor of a dynamic feedback loop of probabilistic inference that emerges over the course of reading. See Culler, *Structuralist Poetics: Structuralism, Linguistics and the Study of Literature* (London: Routledge & Kegan Paul, 1975) 135, Fludernik, *Towards a 'Natural' Narratology* (London: Routledge, 1996) and Karin Kukkonen, "Bayesian Narrative: Probability, Plot and the Shape of the Fictional World," *Anglia* 132.4 (2014) 720-739.

⁹ Locke, *Essay* 656

¹⁰ Patey 142

¹¹ Francis Bacon, *The New Organon* eds. Lisa Jardine and Michael Silverstone (New York: Cambridge University Press, 2000) LXXXII, 67. See also Jardine, *Francis Bacon: Discovery and the Art of Discourse* (New York: Cambridge University Press, 1974) 31

¹² See Arthur Walzer, *George Campbell: Rhetoric in the Age of Enlightenment* (Albany: State University of New York Press, 2003) 82-84

¹³ Hume, *Treatise* 206

¹⁴ Consider, for instance, Smith's formulation of a "general fellow feeling which we have with every man merely because he is our fellow creature." Smith, *The Theory of Moral Sentiments* ed. Knud Haakonssen (New York: Cambridge University Press, 2002) 106

¹⁵ James Boswell, *Life of Johnson* Vol. II (Oxford: Clarendon Press, 1934) 174

¹⁶ Franco Moretti's formulation of a "curvature towards interiority" in reference to *Clarissa* echoes Erich Kahler's account of a general "turn inward" between epic and novel. Georg Lukács contrasts the "abstract idealism" of epic heroes, who lack an "inner problematic" to modern narratives of "disillusionment," wherein the individual, "crushed by the brute force of reality," develops "an interiority which perfects itself in the form of a literary work." See Kahler, *The Inward Turn of Narrative* trans. Richard Winston and Clara Winston (Princeton: Princeton University Press, 1970); Moretti, *The Way of the World: The Bildungsroman in European Culture* (New York: Verso, 2000); and Lukács, *The Theory of the Novel* trans. Anna Bostock (London: The Merlin Press, 1988) 97-112

¹⁷ It is difficult to put a fine point on either the historical criteria of possibility or the historical moment at which possible worlds become a viable way of understanding fiction. The case could certainly be made that Kepler's probably conceived lunar landscape is a possible world, but perhaps not for Godwin's lunar utopia or Cavendish's textual worlds (though to some degree Cavendish means to suggest that the actual world is itself a textual creation). We might say that here we are discussing worlds that are distinct from the actual world but do not contain any elements that contradict common knowledge in this world (e.g. that there is no planet contiguous with ours and geese do not live on the moon).

¹⁸ Lewis, *Counterfactuals* 1

¹⁹ See W.V. Quine, "Worlds Away," *Journal of Philosophy* 73 (1976) 859-63

²⁰ Robert Stalnaker, *Ways the World Might Be* (Oxford: Oxford University Press, 2003) 2-7

²¹ For an elegant summary of debate among actualists, see Barbara Vetter, "Recent Work: Modality without Possible Worlds." *Analysis* 71.4 (2011) 742-754

²² Naïve realism, which is a more hypothetical than real critical position in Pavel's arguments against it, is emblemized by adherence to the real referential potential of proper names, as theorized by Ludwig Wittgenstein and John Searle. McKeon's later formulation of naïve empiricism, by contrast, describes both a text's assumed origin and its referentiality. Watt and Gallagher both identify the articulation of proper but fictional names as a defining aspect of novelistic fiction. See Pavel, "'Possible Worlds' in Literary Semantics" *The Journal of Aesthetics and Art Criticism* 34.2 (1975) 165-176; and Gallagher, *Nobody's Story: The Vanishing Acts of Women Writers in the Marketplace, 1670-1920* (Berkeley: University of California Press, 1994)

²³ Gottfried Wilhelm Leibniz, *Theodicy* trans. E.M. Huggard (New Haven: Yale University Press, 1952) 246

²⁴ Leibniz, *Philosophical Essays* ed. and trans. Roger Ariew and Daniel Garber (Indianapolis: Hackett, 1989) 218

²⁵ This is roughly equivalent to the sense of possibility invokes in Wilkins's and Defoe's thoughts on projects, and in McKeon's formulation of "strange, therefore true" in empirical narratives.

²⁶ Theodicy 372

²⁷ Alexander Baumgarten, *Reflections on Poetry* trans. Karl Aschenbrennet and W.B. Holther (Berkeley: University of California Press, 1954). See Patey 317-318 n.71

²⁸ Joseph Addison et al., *The Spectator* ed. Donald F. Bond, 5 vols. (Oxford: Clarendon Press, 1965) 507

²⁹ Ibid. 337

³⁰ In this respect Leibniz aligns with Hobbes, who, as I argued in chapter two, introduces counterfactual possibilities of an illusory sort, which inevitable lead back to the actual world.

³² There is ample evidence that Johnson did deem *Clarissa* a historically important novel for the precise reason cited in his pseudo-insult, that is, that its contents are translatable to universal moral knowledge to a degree far exceeding previous novels. In *Rambler* no. 4, Johnson nearly dismisses novels entirely as “written chiefly to the young, the ignorant, and the idle, to whom they serve as lectures of conduct, and introductions into life.” Elsewhere in Boswell’s *Life*, Johnson is quoted calling Richardson “an author who has enlarged the knowledge of human nature, and taught the passions to move at the command of virtue.” Perhaps the highest sign of his esteem is that Richardson is the only novelist quoted in the 1755 *Dictionary*. For an account of Johnson’s attitudes towards and correspondence with Richardson see Valenza 215-219

³³ Samuel Richardson, *Clarissa, or, The History of a Young Lady* (New York: Penguin, 2004) Hereafter cited in-text by letter and page number.

³⁴ For another instance of this reading, see William Warner, *Reading “Clarissa”: The Struggles of Interpretation* (New Haven: Yale University Press, 1979) 75. Warner sees *Clarissa*, in her writing, as attempting to claim “dominion: and “appropriate authority” to herself.

³⁵ Watt 198

³⁶ *Ibid.* 201

³⁷ Sandra Macpherson, *Harms Way: Tragic Responsibility and the Novel Form* (Baltimore: Johns Hopkins University Press, 2010) 60

³⁸ “In the legal logic Richardson invokes to think through the question of who has caused and who is to blame for *Clarissa*’s death,” she argues, “persons *are* causes, and personhood is a question of action rather than understanding—of plot rather than character... Emplotment is the form personhood and responsibility take.”³⁸ Rape is thus dependent on the representation of understanding at the level of the novel’s subjects, while murder depends only on the outward form of their actions. *Ibid.* 66

³⁹ Franco Moretti, *The Way of the World: The Bildungsroman in European Culture* trans. Albert Sbragia (New York: Verso, 2010) 46

⁴⁰ These terms do not appear in Lewis but are occasionally adopted by practitioners of possible-worlds-based narratology. For a useful primer see James McCawley, *Everything that Linguists Always Wanted to Know about Logic (But Were Ashamed to Ask)* (Chicago: Chicago University Press, 1978) 326

⁴¹ Marie-Laure Ryan, *Possible Worlds, Artificial Intelligence, and Narrative Theory* (Bloomington: University of Indiana Press, 1991) 111-112

⁴² In a survey of possible worlds approaches to literature, Eve Bannet briefly refers to *Clarissa* as a “rather extreme example” of possibility generation within a text, noting not only projective possibilities, but alternate causal relationships for actualized events. See Bannet, *Postcultural Theory: Critical Theory after the Marxist Paradigm* (New York: Macmillan, 1993) 153

⁴³ *Ibid.* 112

⁴⁴ Richardson, *Pamela* ed. Peter Sabor (New York: Penguin, 1985) 268

⁴⁵ Watt 210

⁴⁶ Thomas Keymer, *Richardson's 'Clarissa' and the Eighteenth-Century Reader* (Cambridge: Cambridge University Press, 1992) 47

⁴⁷ John Richetti, "Richardson's Dramatic Art in *Clarissa*," *Eighteenth Century British Fiction* ed. Harold Bloom (New York: Chelsea House, 1988) 106

⁴⁸ Frances Ferguson, "Rape and the Rise of the Novel," *Representations* 20 (1987) 102

⁴⁹ Watt 214

⁵⁰ Qtd. in Watt 201

⁵¹ "To make his text communicative, the author has to assume that the ensemble of codes he relies upon is the same as that shared by his possible reader. The author thus has to foresee a model of the possible reader." See Eco, *The Role of the Reader: Explorations in the Semiotics of Texts* (Bloomington: Indiana University Press, 1979) 8

⁵² Ibid. 217

⁵³ Robert Stalnaker, *Context and Content* (New York: Oxford University Press, 1999) 85

⁵⁴ This is not to say that readings of *Clarissa* that attend to its questions of sentiment, romantic desire, and sexuality necessarily ignore the metaphysical dimension of its construction. Sarah Nicolazzo, for instance, has recently taken up the novel's use of the words "broad" and "narrow" in order to propose a queer reading. Nicolazzo draws attention to *Clarissa*'s rejection of the claim that she loves Lovelace for its "broad sound," prompting Anna to propose the "narrower sound" of a "conditional liking." Though in this respect *Clarissa* stands for the narrow and Lovelace for the broad, the conflict is described in the way I have above described it: *Clarissa*, seeking alternatives to the certitude of love, conceived of as the engine of romance plots, strives to maintain a conditionality for her actions. Ultimately the cultural apparatus of love, as it is wielded by Lovelace to turn *Clarissa*'s family against her, defeats, or deafens, the alternate possibilities supposed by narrower liking. See "Reading *Clarissa*'s 'Conditional Liking': A Queer Philology," *Modern Philology* 112.1 (2014) 205-225

⁵⁵ Genette, "'Vraisemblance' and Motivation," trans. David Gorman, *Narrative* 9.3 (2001) 240.

⁵⁶ Richardson, *Unlikely Stories: Causality and the Nature of Modern Narrative* (Newark: University of Delaware Press, 1997) 40

⁵⁷ Fielding, *Tom Jones* (New York: Norton, 1973) 305

⁵⁸ Biographer and editor Martin Battestin makes this claim in "Tom Jones: The Argument of Design" *The Augustan Milieu: Essays Presented to Louis A. Landa* eds. Henry Knight Miller, Eric Rothstein, and G.S. Rousseau (Oxford: Clarendon Press) 307

⁵⁹ This example appears in Iser, *The Act of Reading: A Theory of Aesthetic Response* (Baltimore: Johns Hopkins University Press, 1978) 120-122

⁶⁰ The mathematical form of Bayes' theorem is $P(A|B) = P(B|A) \cdot P(A)/P(B)$ where A is the prior hypothesis about the environment, B is the new observation and $P(B|A)$ is the likelihood of making observation B in an environment where A is true.

⁶¹ Alexander Pope, *The Poems of Alexander Pope* ed. John Everett Butt (New Haven: Yale University Press, 1963) 154

⁶² Genette 252-254

⁶³ Michael Riffaterre, *Fictional Truth* (Baltimore: Johns Hopkins University Press, 1990) 6-7

⁶⁴ Bender, *Ends of the Enlightenment* 50-51

⁶⁵ See Thomas Keymer, *Sterne, the Moderns, and the Novel* (New York: Oxford University Press, 2002)

⁶⁶ Watt 292

⁶⁷ *The Life and Opinions of Tristram Shandy, Gentleman: The Text*, ed. Melvyn New and Joan New, 3 vols. (vols. 1 & 2 text, vol. 3 commentary), *The Florida Edition of the Works of Laurence Sterne* (Gainesville: U. Presses of Florida, 1978), vol. I, 180. Hereafter cited by volume of the Florida edition and page number.

⁶⁸ For an extended version of this argument with specific attention to Toby's place within the history of military diagram, see Solomon, "The Novel and the Bowling Green: Toby Shandy's Diagrammatic Realism," *Philological Quarterly* 95.2 (2016) 269-291

⁶⁹ Jonathan Lamb, "Shandeism and the Shame of War," *Tracing War in British Enlightenment and Romantic Culture* ed. Gillian Russell and Neil Ramsey (New York: Palgrave MacMillan, 2015) 16

⁷⁰ See Melinda Rabb, "Parting Shots: Eighteenth-Century Displacements of the Male Body at War" *ELH* 78, (Winter 2011) see esp.127-128; Ann Campbell, "Tristram Shandy and the Seven Years' War: Beyond the Borders of the Bowling Green," *Shandean: An Annual Devoted to Laurence Sterne and His Works* 17 (2006): 106-20; and Madeleine Dobie, "The Enlightenment at War," *PMLA* 124, no. 5 (2009): 1851-54. Keymer reads Toby's bowling green through its kinship with the gardens of Lord Fairfax as described by Andrew Marvell in "Upon Appleton House," a work which Keymer reads as a Genettian "transposition" on Sterne's novel, an extended reference that is never explicitly made. In this political reading, the proper site of the wound is not the body but the psyche and, accordingly, the land itself, which becomes inescapably overwritten with war. The heart of *Tristram Shandy's* politics, then, lies in the fact that Toby never resumes "civilian" life once he begins his project. See Tom Keymer, "Horticulture Wars: Tristram Shandy and Upon Appleton House," *Shandean: An Annual Devoted to Laurence Sterne and His Works* 11 (1999-2000): 38-46

⁷² Ala Alryyes, "Uncle Toby and the Bullet's Story in Laurence Sterne's *Tristram Shandy*" *ELH* 82.4 (2015) 1111

⁷³ *Ibid.* 1118

⁷⁷ Jonathan Lamb, "Sterne, Sebald, and Siege Architecture," *Eighteenth Century Fiction* 19.1 (2006): 21-41

⁸⁰ Toby was wounded in the 1695 attempt led by English and Dutch forces to reclaim the fortress of Namur from the French, who took it in 1692

⁸¹ See Robert Massie, *Peter the Great: His Life and World* (New York: Knopf, 1980) 347

⁸³ Henry Fielding, *Joseph Andrews* ed. Homer Goldberg (New York: Norton, 1987) 148

⁸⁴ Extending the value of this kind of typologizing from the domain of the author to that of the scholar and teacher, William Dowling proposes an alternative to strictly historicist readings of the politics of *Gulliver's Travels*: "For a teacher of whatever critical persuasion is unlikely, today, to deny that 'Flinnap is Walpole,' the crucial difference being that Walpole is no longer the Walpole of the footnotes, the dry Namierite creature of unideological interests and power groupings whose manipulations have little interest for students of literature. The Walpole who Flinnap 'is' is, now, a creature already seen by Bolingbroke and Pope and Swift in demonic and unmistakably symbolic." See William Dowling, "Teaching Eighteenth-Century Literature in the Pocockian Moment (Or, Flinnap on the Tightrope, Kramnick to the Rescue)" *College English* 49.5 (1987) 530

⁸⁵ Engberg-Pederson notes the general decline in the importance of the siege following Vauban's death in 1707, so that Toby's study would strike the reader as antiquated, where the greater contingency of open-terrain battle would resonate more closely with the novel as a whole. On the question of contingency in sieges, Engberg-Pederson explains "Obviously, unpredictable events and chance occurrences would immediately arise in an actual siege, but they would appear as deviations from the theoretical foundation, not as an integral part of it." See Engberg-

Pederson, "The Refraction of Geometry: *Tristram Shandy* and the Poetics of War, 1700–1800," *Representations* 123.1 (2013) 40

⁸⁶ Ibid. 29

⁸⁷ "Arts of publique use, as Fortification, making of Engines, and other Instruments of War; because they conferre to Defence, and Victory, are Power: And though the true Mother of them, be Science, namely the Mathematiques; yet, because they are brought into the Light, by the hand of the Artificer, they be esteemed (the Midwife passing with the vulgar for the Mother,) as his issue." *Leviathan* 151

⁸⁸ *An Essay Upon Projects* i

⁸⁹ Ibid. 177-178

⁹⁰ Patey 69

⁹¹ Ibid. 245

⁹² Engberg-Pederson 38

⁹³ Patey, for instance, largely omits any discussion of the rise of the novel and the place of probability in this movement, and focuses instead on the place of probability in "Augustan criticism."

⁹⁴ This is a paraphrase of the thesis of Noson Yanofsky, *The Outer Limits of Reason: What Science, Mathematics, and Logic Cannot Tell Us* (Cambridge: MIT Press, 2013)

Conclusion

The Abuses of Abstraction

We have seen, over the course of this study, many different ways of framing the relationship between the probable and the true. Without applying the term specifically, Defoe echoes a commonly used sense of probability when he substitutes the claim for the literal truth of *A Journal of the Plague Year* for the status of “true in general.” In that work, however, Defoe presents a scenario in which the turn to probability from facticity would be most warranted, and yet still he, for the most part, chooses to attend to particular facts over larger patterns. As articulated in Defoe’s time, the function of statistics is to derive insights from quantities of data that stifle comprehension. Defoe, though eventually willing to let go of facticity, does not fully embrace the rise of big data. One function of probability inside and outside of literature is as a basis for representation where empirical exactitude is either impossible or onerous. For instance, Fielding’s immortal lawyer is presented as a stand-in for a complete description of a character from whole cloth. This is a version of mathematical, frequentist probability, but it is abstractive rather than predictive. It does not signify what is likely to be true or to become true so much as stand in for a fact or set of facts that are beyond interrogation.

The obviation of fact is a shared pursuit of Fielding the novelist and Fielding the magistrate, who preferred, rather than to engage in lengthy cross examinations, to rule on the basis of his elevated sense of probable characters and occurrences.¹ This application of probability is of course most prominent in trade, a paradigmatic yet disturbing example being the establishment of actuarial tables for maritime insurance, where the lives of slaves would be valued according to various procedures of averaging. Ian Baucom goes so far as to credit the

investment industry supporting the trans-Atlantic slave trade as having “formulated the modern science of knowledge devoted to resolving the terms of the relationship between what is particularly and what typically knowable.”² As we have seen, in *A Journal of the Plague Year*, Defoe intuits the (dubiously) Stalinian maxim that a single death is a tragedy, and a million is a statistic, and accordingly never ventures too far into demographic analysis without mentioning a unique or illuminating case. Sterne parodies the desensitizing force of abstraction in *A Sentimental Journey*, as Parson Yorick, finding himself distracted rather than affected by thoughts of “the millions of my fellow-creatures born to no inheritance but slavery,” reports instead that he “took a single captive, and having first shut him up in his dungeon... then look’d through the twilight of his grated door to take his picture.”³ In the course of populating this imaginary cell with empirical details drawn from other sentimental literature, Yorick moves himself to tears and finds the emotional outlet he was seeking. Critics have characterized Toby Shandy’s redirection of painful emotions along similar lines, as Alryyes, Lamb, and Keymer note that Toby, who famously would not hurt a fly, is able to recreate with glee battles where thousands died. Where these critics would associate this contradiction with the effects of war, or the hegemony of militarism, we might say that Toby Shandy’s remarkable capacity for select abstraction is a late effect of the ascendance of mathematical probability in European thought.

One story I have attempted to tell in this study is that of probability’s progression from a quality of fiction used to supplement empirical evidence, to a consolidation of empirical evidence, to a kind of substitute for empirical evidence, thus capable of serving science and fiction in distinct manners. In fiction, the period during which probability is primarily associated with advancing truth claims is relatively short. From Aristotle, to Fielding, to Toby Shandy, the probable is deemed superior to the true by virtue of being an ideal distillation of unwieldy, or

otherwise disagreeable facts. As the world around the novel comes to be defined by increasingly abstract, probabilistic transactions, the next iteration of “realist” fiction attempts to recuperate what is lost in tables, generalities, and averages.

Notes

¹ Allen D. Boyer, “Justice Fielding, the Novel, and the Law,” *Yale Journal of Law & the Humanities* 4.1 (2013) 202-204

² Ian Baucom, *Specters of the Atlantic* (Durham: Duke University Press, 2005) 31-39

³ Laurence Sterne, *A Sentimental Journey* eds. Ian Jack and Tim Parnell (New York: Oxford University Press, 2003) 61