

CAUSATION AND SCIENTIFIC EXPLANATION IN LOCKE

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ABSTRACT

PATRICK J. CONNOLLY: Causation and Scientific Explanation in Locke
(Under the direction of Alan Nelson)

This dissertation examines the topics of causation and scientific explanation in the philosophy of John Locke. The first half of the dissertation focuses on causation. Previous interpreters have assumed that Locke was offering a metaphysical theory of causation. I show that this was not Locke's project. He was instead offering a psychological account of causation; he was attempting to account for our cognition of causal processes and the sorts of causal attributions and judgments we make.

On my view, Locke thinks we understand causation as a relation between two powers. So I begin by examining Locke's views on our ideas of power and relations. I show that Locke distinguishes between several different types of idea of power in the *Essay*. I then argue that by deploying these distinctions Locke can avoid the problems posed by his commentators. With respect to relations, I argue that Locke is interested in the psychology of relations; he seeks to explain relations as a mental comparison of ideas. I also argue, *contra* several recent interpreters, that Locke does not offer a metaphysical theory about external-world relations. Once we are furnished with an account of the ideas of power and relations, Locke's psychological account of causation becomes surprisingly clear.

In the latter half of the dissertation I turn to questions about causation in the physical world and to scientific explanation. I examine the topics of mechanism, superaddition, laws

of nature, and the status of hypotheses in Locke's thought. My general goal is to show that Locke's views on natural processes and scientific explanation are governed by a certain form of epistemic humility. I argue that because of this epistemically humble approach Locke did not make any substantive claims about the nature of causation in the physical world. On my view, Locke was agnostic about how the process of superaddition was meant to work, did not believe laws of nature were causally efficacious, and only endorsed scientific hypotheses which respected the strict limits to human knowledge.

To Mom and Dad, in deepest gratitude, for everything

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1. Introduction

Reviewing his 26th Chapter, (*of Cause and Effect, &c.*) I found that he acquaints us very exactly, how we gain the *Ideas* of them by our Senses; but he proceeds not to show us (which yet he often does on other occasions) in what the nature of *Causality* consists...

- John Sergeant¹

1. Introduction

What is it for one thing to *cause* another? For a baseball to cause a window to break? For gravitation to cause the planets to move in elliptical orbits? For my decision to take a sip of water to cause the muscles in my arm to move? Questions like these have been of perennial interest to philosophers and several philosophers have developed theories of what *causation* is. These philosophers have attempted to understand what happens at the fundamental level of reality when one thing causes another. In contemporary philosophy this sort of approach is seen in the work of philosophers like Ned Hall or L.A. Paul.² In the early modern period this was the approach to causation taken by philosophers like Descartes, Spinoza, and Malebranche.

¹ Sergeant 1697, page 254.

² See, for example, Hall 2000, Hall 2002, Hall 2004a, Hall 2004b, Paul 1998, Paul 2000, Paul 2007, and Paul and Hall 2013.

But another approach employed by philosophers has been to focus on human thinking about causation. Causal concepts like *production*, *generation*, *moving*, and *willing* are some of the most fundamental and useful components of our mental economy. So some philosophers have thought it important to ask questions about our cognition of causation. What grounds our causal judgments? When, if ever, do we have knowledge of causal processes in the world? What is going on in our minds when we say that x caused y ? Put simply, how do human beings understand causation? In contemporary philosophy this approach has been taken by philosophers like Susanna Siegel and James Woodward.³ In the early modern period this was arguably the approach taken by Hume and (leaving aside important details) by Kant.

The fundamental goal of my dissertation is to argue that Locke was the second kind of philosopher; he was far more interested in human thinking about causation than he was in the metaphysics of causation. Given this, the theory of causation we should look for in Locke should be a theory of causal cognition, not one of metaphysical causation.

My dissertation also has a secondary goal. The secondary goal is to explicate some of Locke's attitudes toward scientific theory and practice. The connection between philosophy and the natural sciences was extremely close in the early modern period. And Locke is very much a testament to this. From his study of chemistry during his student day at Oxford, to his medical practice, to his close association with figures like Boyle and Newton, and on through his induction into the Royal Society, Locke displayed a keen interest in both scientific theory and practice. There is increasing recognition that scientific concerns were not far from Locke's mind as he composed the *Essay*. Yet Locke scholars have struggled to

³ See, for example, Siegel 2009, Siegel 2011 (chapter 5), Woodward 2007, Woodward 2010, and Woodward 2011.

gain even broad consensus with respect to Locke's scientific beliefs and positions. In this dissertation I will argue that once we understand Locke's scientific claims in the context of his epistemology we will be able to make more progress.

In the rest of this introduction I shall say more about these two goals and how they are related. But prior to that it is necessary to address a more general topic. What might one expect Locke to say about topics like causation and scientific explanation? What will his orientation be in approaching these topics? It seems to me that a reasonable answer to these questions must involve looking at Locke's greatest work, *An Essay Concerning Human Understanding* (hereafter, the *Essay*), more broadly. Specifically, a complete answer to this question will have to make some appeal to the structure of the *Essay* and Locke's purpose in writing it. So in the next section I want to take a brief digression to examine these topics. Much of what I will say is contentious. My goal is not to offer a stand-alone defense of this as the proper way of interpreting the *Essay*. That task would require an entire dissertation in itself.⁴ Instead, my goals are a) to explain and motivate a certain way of understanding the *Essay* and b) to provide the appropriate background for the interpretation of Locke on causation and scientific explanation offered in subsequent chapters.

2. One Way of Interpreting the Essay

The structure and content of the *Essay* are determined by two distinct things. The first is Locke's goal and the second is Locke's method. The goal is a description of human understanding. The method for achieving this goal is what Locke refers to as his "way of ideas." I will discuss each of these in turn.

⁴ See Brown 2006 for a fully developed defense of an interpretive scheme broadly similar to the one sketched below. See also Priselac 2013.

2.1 Locke's Goal: Describing the Human Understanding

One can gain valuable insight into Locke's goal before one even begins to read his book. The very title of Locke's philosophical tome is instructive. Locke's book is not entitled *The True Intellectual System of the Universe* or *Le Monde* so it not (obviously) a book which promises to tell us about the world and its contents. It is not entitled *Enchiridion Metaphysicum* or *Principia Philosophiæ* so we should not (necessarily) expect it to teach us truths about metaphysics or first philosophy. It is also not entitled *De la Recherche de la Vérité*, so the *Essay* does not present itself as a search for philosophical truth. The book is also not entitled *An Antidote to Atheism* or *A Demonstration of the Being and Attributes of God* so neither natural nor revealed theology is its chief concern.⁵

Instead the *Essay* is entitled *An Essay Concerning Human Understanding*.⁶ There are two notable things about this title. The first is that the *Essay* is precisely that, an essay. As the etymological root of the word indicates, it is an attempt at something. Other titles would have suggested that Locke meant to expound dogmatically about the nature of a set subject. Instead, in calling his book an *Essay* Locke suggest that he is attempting to explore, explain, or describe his given subject. And indeed, some of Locke's remarks about the *Essay* support this. Consider the following four quotes:

⁵ None of this is meant to deny that Locke does address issues related to the external world, metaphysics and first philosophy, philosophical truth, and (natural and revealed) theology in the *Essay*. Rather, it is to emphasize that these are not Locke's *principal stated concerns* in writing the *Essay*. And it is to suggest that when these topics are discussed in the *Essay* they are addressed obliquely, in a distinct context, and in a distinct framework.

⁶ It seems to me that the predecessor with the most similar title might be the Port-Royal logic, which at the time was commonly referred to as *The Art of Thinking*.

If any, careful that none of their good thoughts should be lost, have publish'd their censures of my *Essay*, with this honour done to it, that they will not suffer it to be an *Essay*....⁷

For though it be certain that there is nothing in this Treatise the truth whereof I am not fully persuaded, yet I consider myself as liable to mistakes as I can think thee, and know that this book must stand or fall with thee, not by any opinion I have of it, but thy own.⁸

But yet I Know not wt is owing to those who wth an air of infallibility adopt what others have proposd & set themselves up for Dictators in the Commonwealth of learning wth an authority tht will not suffer us poore enquirers & underlings to write in o[u]r own way & as we are able. *That with out their leave must must not be an Essay wch was ~~desi~~XX designed & professed to be nothing else...*⁹

For I never had the vanity to hope to outdo all other men. Nor did I propose to myself, in publishing my *Essay*, to be an answerer of questions; or expect that all doubts should go out of the world, as soon as my book came into it. [¶] The world now has my book, such as it is: if any one finds, that there be many questions that my principles will not resolve, he will do the world more service to lay down such principles as will resolve them, than to quarrel with my ignorance (which I readily acknowledge) and possibly for that which cannot be done.¹⁰

So Locke is keen to highlight that his *Essay* is not a dogmatic work at all.¹¹ It is an initial

⁷ *Epistle to the Reader*. All references to the *Essay* in this dissertation are to Locke 1975.

⁸ *Epistle to the Reader*. Locke does refer to his work as a “treatise” in this quote, which might be thought to hurt the point I am making here. Treatise, to modern ears, sounds like a dogmatic exposition. But the word did not always have this connotation. The OED explicitly distinguishes between contemporary and antiquated uses: “treatise, *n.* 1.a. A book or writing which treats of some particular subject; commonly (*in mod. use always*), one containing a formal or methodical discussion or exposition of the principles of the subject; *formerly more widely used for a literary work in general.*” Emphasis added. A later definition is even more telling: “1.c. A descriptive treatment, description, account (of something). *Obs.*” Note as well Glanvill’s usage of “treatise” below.

⁹ Ms. Locke d. 3, page 2. Emphasis added. This passage is from an early 1694 draft of Locke’s *Examination of Malebranche*. The first several sections of this early draft differ significantly from the version which was eventually published. All manuscript quotations (except where otherwise noted) are my own transcriptions from the Lovelace Collection held in the Bodleian Library, Oxford.

¹⁰ *An Answer to Remarks Upon the Essay*. Locke 1823, volume 4, page 188.

¹¹ Leibniz was one of Locke’s contemporaries who noticed this implication of Locke’s title. In his *New Essays* he has Philalethes report that he has benefitted from “a book which has had several reprintings in England under the *modest title* [titre modeste] *Essay Concerning Human Understanding*.” Leibniz 1996, page 70. Emphasis added.

attempt at understanding how the mind works. This attitude of humility and caution is another feature of the *Essay* which sets it apart from other early modern philosophical works. Contrast the attitude displayed here with Descartes' repeated assertions that if any one of his claims were false his entire system was false.¹² Locke instead means for his book to be an essay in the same way that Joseph Glanvill uses the word in the dedication of his book to the Royal Society: "I say then, there being so much to be produced both from the natural and moral World to the shame of boasting Ignorance; the ensuing Treatise, which with a timorous and unassur'd countenance adventures into your presence, can pride it self in no higher title, than that of an ESSAY, or imperfect offer at a Subject..."¹³ So Locke's title is interesting insofar as it tells us something about the shape of the book.¹⁴

The second reason that the title is interesting is that it tells us about the subject of the book; it is about the human understanding. I think this delimitation of subject matter is interesting and very often ignored by those examining Locke's thought. A contrast with Descartes is perhaps useful here. Descartes sought to philosophically examine everything. Not just the contents and workings of the human understanding, but also its metaphysical

¹² 1) "I am prepared to admit that if what I have written on this topic [the circulation of the blood] or on refraction—or on any other subject to which I have devoted more than three lines in my published writings—turns out to be false, then the rest of my philosophy is entirely worthless." To Mersenne 9 February 1639. Descartes 1991, page 134. 2) "I must admit that if the view [Copernicanism] is false, so too are the entire foundations of my philosophy, for it can be demonstrated from them quite clearly." To Mersenne, end of November 1633. Descartes 1991, page 41. 3) "I must tell you that all the things I explained in my treatise, which included the doctrine of the movement of the earth, were so interdependent that it is enough to discover that one of them is false to know that all the arguments I was using are unsound." To Mersenne, April 1634. Descartes 1991, page 42. 4) "[If the propagation of light was not instantaneous and] such a time-lag were detected, my philosophy would, I admitted, be completely overturned." To Beeckman, 22 August 1634. Descartes 1991, page 46.

¹³ Glanvill 1665, unnumbered page (3rd from last) in the dedication.

¹⁴ For more on the connotations and implications of the word "essay" in Locke's 17th century scientific and rhetorical context see Walmsley 2003, chapter 3 and for the connotations and implications of the word in early modern Europe more generally see Mercer *manuscript*.

basis, as well as the nature and status of the material world, the nature and status of eternal truths and logic, and the nature of God. Descartes meant for his philosophical theories to be universal. Put differently, the scope of his project was unrestricted. For better or worse, Locke is normally read by students shortly after they have read Descartes. And, for better or worse, Locke is often considered by philosophers to be operating in the wake of Descartes and engaging in a project structurally similar to Descartes'. My contention, however, is that Locke's project is importantly different from Descartes insofar as the scope of Locke's project is much narrower.¹⁵ Although Locke does occasionally digress, his true aim is to examine the human understanding. And indeed, it is just on those topics that extend beyond the contents and workings of the human understanding (the external world, eternal truths, God's nature) that we most often find Locke either admitting ignorance or claiming that the scope of his project is limited.

A comparison to Hume may also be useful here. Questions about the method, scope, and content of Hume's project are slightly more contentious than those about Descartes', but nevertheless I think that in the case of Hume there is widespread recognition that he intended to limit the scope of his project. Hume's goal, as the titles of the two relevant works (*A Treatise of Human Nature* and *An Enquiry Concerning Human Understanding*) suggest, was a "science of man." Hume's goal was not to describe or argue about the entire world, but rather to describe the human mind, to practice a sort of primitive psychology. My suggestion

¹⁵ This is not to deny that there are important similarities. Both Descartes and Locke use ideas as the foundation for mental explanation. And much of Locke's Book IV discussion of knowledge bears a marked similarity to passages and themes in Descartes' *Regulae*.

is that Locke's title should lead us to expect something more like what is found in Hume than what is found in Descartes.¹⁶

Locke's remarks in the opening pages of the *Essay* support the expectation provided by the title. In the very first paragraph of the *Epistle to the Reader* Locke claims explicitly that his subject matter is the human understanding.¹⁷ And Locke's introductory chapter (1.1) follows the same path. 1.1.1 informs the reader that the understanding is worth enquiring into, and that investigation into the nature of the understanding is a difficult, though pleasant, endeavor.¹⁸ And at 1.1.4 Locke again describes his project as an "Enquiry into the Nature of the Understanding."

Following a very long philosophical tradition, Locke believed that one primary purpose of the understanding was the acquisition of knowledge. And Locke's belief was that it was only once we understood the human understanding that we could understand human knowledge. Locke writes of the origin of the *Essay* that it came about when he and some friends were debating an unrelated subject and unable to make any progress:

After we had a while puzzled our selves, without coming any nearer a Resolution of those Doubts which perplexed us, it came into my Thoughts, that we took a wrong course; and that, before we set our selves upon Enquiries of that Nature, it was necessary to examine our own Abilities, and see, what Objects our Understandings were, or were not fitted to deal with.¹⁹

¹⁶ And further support for this point is provided by Locke's working title for Drafts A and B of the *Essay*: *De Intellectu* (or sometimes *De Intellectu Humano*).

¹⁷ "...and he that is little acquainted with the subject of this treatise—the UNDERSTANDING..." *Epistle to the Reader*. And shortly thereafter: "[this book] was not meant for those, that had already mastered this Subject, and made a thorough Acquaintance with their own Understandings..."

¹⁸ Citations to the *Essay* will be made by book, chapter, and section number. For example, 2.8.14 would refer to the fourteenth section of the eighth chapter of the second book.

¹⁹ *Epistle to the Reader*. And Locke offers a similar account at 1.1.7: "This was that which gave the first Rise to this Essay concerning the Understanding. For I thought that the first Step towards satisfying several Enquiries, the Mind of Man was very apt to run into, was, to take a Survey of our own Understandings, examine our own Powers, and see to what Things they were adapted..."

So Locke's thought is that one consequence of examining the understanding will be a better grasp on human knowledge. I believe that this description of the scope and limits of human knowledge plays a sufficiently autonomous role in the *Essay* that we can refer to it as a secondary goal of the book. It is attendant on the primary goal of describing the human understanding, but nonetheless can be differentiated from it and usefully spoken about in isolation from it.

This secondary task of demarcating the scope and limits of human knowledge was not just a critical component of a description of human understanding and was not just interesting and useful in its own right. Locke thought there were also polemical benefits to this demarcation. Because Locke thought human knowledge was actually quite limited he likely understood the *Essay* to be an effective weapon in arguing against those who made far-reaching or dogmatic claims in a number of domains. So, for Locke, the *Essay* would have theological benefits insofar as it would refute the claims of Quakers and other Dissenting sects. This would help to shore up Anglicanism and other moderate denominations. The situation in politics was similar. The *Essay* would refute the claims of divine-right monarchists and Jacobite radicals. This would help to shore up representative government and the Glorious Revolution. Finally, demonstrating the narrow scope and strict limits of human knowledge would have scientific benefits. It would refute the claims of rationalist and Scholastic natural philosophers. This would help to shore up the productive and useful work being done by the Royal Society and its allies.²⁰ So perhaps it is fitting to describe these theological, political, and scientific agendas as the tertiary goals of the *Essay*.

²⁰ Of course, this does not mean that the *Essay* is directly *about* religion, politics, or natural philosophy. As I maintained above, it is *about* the human understanding. Nonetheless, a book about one subject matter can have

2.2 Locke's Method: The Way of Ideas

In the previous sub-section we saw that the goal of the Essay is a description of the understanding both with respect to its contents and with respect to its operations (which are partially responsible for its contents). But just understanding the goal of the Essay is not enough. We also need to examine Locke's method for achieving that goal. Locke attempts to deliver this description of the understanding in terms of ideas. So the goal of this section is to give an overview of Locke's "way of ideas."²¹

We can begin our examination of Locke's methodology with his own words. The following quote gives Locke's clearest statement of what he means by "way of ideas":

My new way by ideas, or my way by ideas, which often occurs in your lordship's letter, is, I confess, a very large and doubtful expression, and may, in the full latitude, comprehend my whole Essay: because treating in it of the understanding, which is nothing but the faculty of thinking, I could not well treat of that faculty of the mind, which consists in thinking, without considering the immediate objects of the mind in thinking, which I call ideas: and therefore in treating of the understanding, I guess it will not be thought strange, that the greatest part of my book has been taken up, in considering what these objects of the mind, in thinking, are; whence they come; what use the mind makes of them, in its several ways of thinking; and what are the outward marks whereby it signifies them to others, or records them for its own use, And this, in short, is my way by ideas, that which your lordship calls my new way by ideas; which, my lord, if it be new, is but a new history of an old thing. For I think it will not be doubted, that men always performed the actions of thinking, reasoning, believing, and knowing just after the same

important consequences for a different subject matter. For example, no one would claim that Newton's *Principia* is *about* natural theology, instead is clearly about mathematics and natural philosophy. Nevertheless, the book had important consequences for natural theology, namely it served to shore up belief in a provident God. And, in fact, Newton intended for the book to do this: "When I wrote my treatise about our system, I had an eye upon such principles as might work with considering men, for the belief of a deity, and nothing can rejoice me more than to find it useful for that purpose." To Bentley, 10 December 1692. Newton 2004, page 94.

²¹ Locke and Stillingfleet use the phrase "way of ideas" to refer to Locke's methodology throughout their correspondence. Locke is also content to use the phrase "way by ideas." I prefer "theory of ideas." But, as Locke would no doubt point out, the name we use is less important than the content it conveys.

manner that they do now; though whether the same account has heretofore been given of the way how they performed these actions, or wherein they consisted, I do not know.²²

This quote is both long and dense. It will be worthwhile to work through it in stages to understand Locke's meaning. First, Locke writes that the way of ideas is something which “comprehends” his entire work. I take this to mean that the topic matter of the *Essay* is uniform and that he has the same goal throughout.²³ Further, I take this to mean that Locke is employing the same methodology throughout; he is consistent in pursuing this “way of ideas.”

Locke next repeats a point familiar from the last section of this chapter; his goal in the *Essay* is to provide an account of human understanding. He wants to take a survey of the human mind. But there is also something new added here. Locke tells us something about how he will undertake this survey. He tells us about the method he will employ and why he will employ it. Locke's route to examining the understanding will be ideas. This immediately raises two questions. First, what are these ideas? Second, why does Locke intend to focus on ideas when his goal is the understanding? I will address these in order.

First, what are ideas? The nature of Lockean ideas is immensely controversial. This controversy has proceeded primarily along two axes. First, many have argued over the metaphysical status of Lockean ideas. Second, many have argued over the manner in which Lockean ideas are (or are not) representational. Fortunately we are able to side-step both of these questions for the present moment. Locke's considered position on the metaphysical

²² *Reply to Stillingfleet*. Locke 1823, volume 4, pages 134-135.

²³ This position contrasts with a traditional approach to the *Essay* exemplified by, for example, Bennett 1971 and Mackie 1976. On this view the *Essay* is something of a grab-bag; Locke flits from topic to topic (substance, free will, personal identity, the nature of religious belief, etc.) producing a sort of survey.

status of ideas is quietism.²⁴ He does not purport to know or describe their metaphysical status. Locke's considered position on the representational nature of ideas, while slightly more complicated, can be described as providentialist; we do not need to worry about whether and how our ideas represent because a benevolent God has ensured that they are produced in ways that are beneficial for us and He has ensured that they furnish us with useful information (even if we do not understand the manner in which they are produced and the reasons why the information is useful).²⁵ So in asking what Lockean ideas are I propose we set aside the controversial questions of their metaphysical and representational status.

Instead, I suggest that we content ourselves with Locke's description of what ideas are. At the outset of the Essay Locke tells us that "idea" is "that Term, which, I think, serves best to stand for whatsoever is the Object of the Understanding when a Man thinks, I have used it to express whatever is meant by *Phantasm*, *Notion*, *Species*, or whatever it is, which the mind can be employ'd about in thinking..."²⁶ So Locke conceives of ideas as the primary building blocks of our mental economy. Ideas are ways of thinking about mental contents. Moreover, ideas have a monopoly on the mental. They are the sole building blocks of our

²⁴ "So that supposing ideas real spiritual things ever so much, if they are neither substances nor modes, let them be what they will, I am no more instructed in their nature, than when I am told they are perceptions, such as I find them." *Examination of Malebranche* §18, Locke 1823, volume 9, page 220. Also, "This therefore may be a sufficient excuse of the ignorance I have owned of what our ideas are, any farther than as they are perceptions we experiment in ourselves; and the dull unphilosophical way I have taken of examining their production, only so far as experience and observation lead me; wherein my dim sight went not beyond sensation and reflection." *Remarks on Norris* §18, Locke 1823, volume 10, page 256. See Allen 2010 for a sustained discussion and defense of this interpretation.

²⁵ See Rogers 2004 for a version of this view.

²⁶ 1.1.8.

thought; mental content can only be thought of in terms of ideas.²⁷ Now we can ask the second question: why does Locke intend to focus on ideas? Why a “way of ideas”?

Locke writes that although the goal of his Essay is a description of the human understanding he “could not well treat of” the understanding “without considering the immediate object of the mind in thinking, which I call ideas.” So Locke's reason for adopting the “way of ideas” is necessity.²⁸ He says that his topic matter requires him to write about ideas. So “it will not be thought strange” that he continuously speaks of them. Locke claims that the understanding is much like the eye insofar as it is responsible for perceiving many things, but struggles to perceive itself.²⁹ Ideas are a way to perceive the understanding, just as a looking glass might help one perceive the eye.

So far, so good. We now know that Locke's goal is to describe the human understanding (its contents and operations). We also know that to accomplish that goal Locke thinks he will have to present his findings in terms of ideas. Ideas will be the primary focus of his enquiry and, furthermore, his findings will be reported within a framework of ideas. But we still need to say a bit more before we have a full picture of Locke's “way of ideas.”

One critical distinction is between ideas of sensation and ideas of reflection. Ideas of sensation are ideas received from one of the five external senses. Ideas of sensation track

²⁷ Of course, this contrasts with a popular contemporary approach to mental contents in which there are fundamentally different types of mental contents. Perceptions, for example, are thought by some to be different in kind from concepts. Or beliefs are thought, by some, to be something over and above the representations they govern. Similarly, one might argue that there is a substantive difference between propositional and non-propositional content. On Locke's view, terms like perception, concept, belief, and representation all refer to ideas (albeit different ideas which have very different internal structures and contents).

²⁸ The theme of necessity is repeated at 1.1.8 where Locke apologizes for using the word “idea” so frequently but claims that he “could not avoid frequently using it.”

²⁹ 1.1.1.

operations of our sensory organs. Ideas of reflection are slightly more complicated. Ideas of reflection are produced when the mind does something or performs some activity: they track operations of the mind.³⁰ Just as different operations of the sensory organs give us different ideas of sensation (red, green, salty, and so on) different operations of the mind give us different ideas of reflection (memory, comparison, volition, and so on).

Another fundamental feature of Lockean ideas is their compositionality. Locke thinks that the mind is capable of uniting these simple ideas of sensation and reflection into complex ideas.³¹ Locke offers us a helpful metaphor which speaks to the distinctively compositional character of ideas. He compares them to individual letters of an alphabet. Each letter by itself is minimal and conveys very little. Yet letters can be combined in a vast number of ways to create meaningful words and sentences.³²

So Locke's picture of the mind (at a high level of abstraction) is this: the mind acquires ideas from its sensory organs and performs a series of operations on those ideas. Those operations themselves also produce ideas (of reflection). So our everyday experience is of a huge number of ideas, both of sensation and reflection. Locke's goal in the *Essay* is to examine these ideas that make up our thought and the processes that led to their creation. He thinks that doing this will help us to learn about the understanding. Why? Because the understanding is, in large part, responsible for these ideas (it produced the ideas of reflection

³⁰ 2.6.1: "The Mind receiving the *Ideas*, mentioned in the foregoing Chapters, from without, when it turns its view inward upon it self, and observes its own Actions about those *Ideas* it has, takes from thence other *Ideas*..."

³¹ Note that this action of the mind, uniting two ideas together, is precisely that, an action of the mind. This means that in every instance where the mind has united two ideas together there will also be a simple idea of reflection marking that act of the mind.

³² 2.7.10. Locke's analogy is a loaded one. The metaphor was common among early corpuscularians striving to show that a small number of types of corpuscle could combine to account for the vast number and diversity of perceivable objects. See Boyle 1999-2000, volume 8, pages 107 and 402 or Grew 1675, pages 42-43.

and assembled all of the complex ideas). So Locke reports that a large part of his book is made up of his considering “what these objects of the mind, in thinking, are; whence they come; what use the mind makes of them, in its several ways of thinking...”³³

At this point it may be worth turning from Locke's description of his "way of ideas" to Stillingfleet's characterization of the method. Here is Stillingfleet's clearest summary of how he understands the project of the *Essay*:

Let men express their minds by ideas, if they please; and take pleasure in sorting, and comparing, and connecting of them, I am not forward to condemn them: for every age must have its new modes; and it is very well, if truth and reason be received in any garb. I was therefore far enough from condemning your way of ideas...³⁴

Stillingfleet understands the *Essay* as a sort of inventory of the mind's ideas. He thinks that Locke's goal is to sort, compare, and connect various ideas in his mind. This is very perceptive. It aligns neatly with Locke's claim, in the above-quoted passage, that he is offering a *history* of the mind's activity. Locke thinks that by sorting his ideas into categories he can get a sense for the fundamental types of ideas the mind uses in thinking (they turn out to be substances, relations, and modes). He thinks that by comparing different ideas we can examine their differences and understand the different processes the mind undergoes in shaping its ideas. And Locke thinks that it is various forms of agreement and disagreement between ideas that constitute knowledge. Exploring our different ideas and their connections to one another will let us determine the scope and bounds of human knowledge.

³³ *Reply to Stillingfleet*. Locke 1823, volume 4, page 134.

³⁴ Quoted by Locke, *Reply to Stillingfleet*. Locke 1823, volume 4, page 128.

So Locke's goal is to offer a taxonomy and a genealogy of our ideas. The taxonomy will allow us to speak rigorously about each of our ideas and understand the ways in which the mind is prone to group simple ideas into complex ones. The genealogy will allow us to understand the steps which the mind took in constructing specific ideas (including very complex ones like the idea of God or the idea of infinity). Locke hopes this will let him make good on his claim that an examination of ideas will shed a great deal of light on the understanding and its operations.

3. Does Locke Even Have a Theory of Causation?

As mentioned in Section 1, the primary goal of this project is to give a comprehensive and coherent account of Locke on causation. In a way, this might be a surprising goal for a dissertation on Locke. The standard list of topics in Locke studies is well known: the primary-secondary quality distinction, substance, personal identity, free will and voluntary action, the account of private property, contractual government, etc. Causation is not a member of this list.

Given this, there is a very important question which must be addressed at the outset. Can anything worthwhile be said about Locke on causation? Does Locke's account of causation actually merit a sustained treatment? Surveying the literature, the favored answer to these questions is a strong "no." In fact, Locke's account of causation has often been the subject of severe criticism. As far back as 1937, R. I. Aaron called the language in II.26 "laborious and unsatisfactory" and concludes that "Locke's theory of causality fails because his analysis of our experience of the causal relation fails."³⁵ D. J. O'Connor says that

³⁵ Aaron 1937, pages 182, 187.

Locke's account of causation is "one of the least satisfying features of the *Essay*."³⁶ Michael Ayers writes that the account of cause and effect is "unemphatic", "unsatisfying" and "hardly more than an appendix to the chapter on ideas of relations."³⁷ Much more recently, Angela Coventry notes previous negative reviews and concurs, claiming that the account is "brief and lacking in depth."³⁸ The scholarly consensus seems to be that Locke does not offer a theory of causation which is interesting or insightful.

There is also the problem of texts. Locke, unlike, say, Malebranche, did not spend page after page discussing causation.³⁹ The relevant textual selections are quite short. There is a brief discussion of causal power at 2.21, but it seems to be little more than a prelude to Locke's account of free will. There is also a brief discussion of cause and effect at 2.26, but it seems to be little more than a coda to Locke's account of relations. So there may be reason to think that no satisfying account of Locke on causation is available because there is simply not enough text or because the few passages that do exist are too superficial and shallow.

I, however, do not agree with the many commentators who think Locke's account of causation is a failure. I do think the *Essay* offers enough relevant texts to show that Locke has a coherent and, in some ways, quite sophisticated account of causation. But, in large part, the proof of this pudding will have to be in the eating. Subsequent chapters of this dissertation will attempt to make good on my assertions. I hope these chapters will show that Locke's position was both interesting and that it can help us to understand other areas of his

³⁶ O'Connor 1967, page 94.

³⁷ Ayers 1991, volume 1, page 163.

³⁸ Coventry 2003, page 96.

³⁹ However, as Marleen Rozemond kindly pointed out to me, Descartes spent little more than two pages writing about causation and this has done nothing to prevent the growth of a massive body of literature discussing Descartes' theory of causation.

philosophy. Further, I believe that the interpretation I offer in subsequent chapters is firmly grounded in Locke's text, though many of the texts I appeal to are not from passages where Locke is explicitly discussing causation. So my hope is that this dissertation is evidence that Locke's account of causation is worthy of scholarly consideration and does offer something of interest to the historian of philosophy.

4. Locke's Account of Causation

In Section 2 I gave a brief summary of the way in which I understand the *Essay*. And in the previous section I claimed that while many see dim prospects for an account of Locke on causation I am optimistic. Part of the reason for my optimism is the belief that previous interpreters of Locke have been looking for the wrong *kind* of theory of causation. Prior to attempting to understand Locke on causation I think we must ask ourselves what *sort* of theory of causation we should look for in his writings. More specifically, given Locke's aims and strategies in the *Essay* what sort of theory of causation should we look for? I now want to suggest that given Locke's aims and strategies in the *Essay* we have a clear answer to this question.

My claim is that this understanding of the scope and method of the *Essay* should motivate us to search for a *psychological* account of causation rather than for a *metaphysical* account of causation in Locke. It would be quite surprising if a book dedicated to examining the human understanding also offered an account of what happens at the fundamental level of metaphysical reality when one thing causes another. Instead, we should be looking for an account of how the human mind grapples with, understands, fails to understand, and makes judgments about causal processes.

Put slightly differently, I think we should expect Locke to offer us an account of causation but I think we must be very careful about what kind of account we expect him to offer. If we expect a metaphysical account then we are bound to be disappointed. I think that an expectation of a metaphysical account of causation is what has led so many previous commentators to be disappointed with what they have found in Locke. If however, we expect to find a psychological account of causation then I think we will be richly rewarded.

5. Causation in the Natural World?

Many commentators have thought that Locke does have a substantial account of the metaphysics of causation on offer in the *Essay* but that it does not appear in the places where one might expect it. They think that Locke's claims about our ideas of power and about our ideas of cause and effect are either unrelated or only tangentially related to the developed account of causation that Locke actually offers. More specifically, these commentators have thought that Locke's interest in causation is truly piqued when he discusses the natural world. A number of commentators have developed detailed interpretation of exactly how Locke understands causation in nature and the production of natural phenomena.

These accounts center on Locke's discussion of mechanism, superaddition, and the laws of nature. Those who read Locke as a strict mechanist claim that the only causes in nature are collisions of bodies. Those who read Locke as committed to the existence of non-natural superadded properties argue that God plays an important role in the causal properties that bodies have. And other commentators claim that Locke understands laws of nature as causal. In the final three chapters of the dissertation I directly engage the relevant literature and take issue with these claims. I argue that Locke does not intend to commit himself to substantial theses about the metaphysics of causation when he discusses these topics.

The project of the final three chapters is not meant to be wholly negative, however. I intend to do more than merely suggest that Locke was not offering a metaphysics of causation. I think that these chapters also shed significant light on Locke's beliefs about the scope of our knowledge, about the role of natural philosophy, and about proper scientific methodology. In addition, I think that they also make positive contributions to several major debates in Locke studies.

Recent decades have seen a growth in interest in Locke's scientific thought.⁴⁰ And while much of the recent scholarship on this subject has been much-needed and of high-quality, much of it seems to ignore Locke's larger views about the proper roles and aims of natural philosophy. These three chapters seek to correct that by showing that Locke had very specific and deep-rooted views on the roles and aims of science and that, when properly understood, these views can inform debates about topics of specific scientific importance in Locke.

My position is roughly this: Locke believes that the proper roles and aims of natural philosophy are extremely limited. He does not believe that the role of science is to inform us about the world and the workings of nature. Instead, Locke believes that the role of science is to offer us material improvements and advances in productive technology. Locke's reasons for thinking this stem from his general epistemic humility. Locke believes that humans know very little and, moreover, were designed by God to know very little. Given our innate epistemic limitations we should not expect too much from science.

Understanding this helps us to understand Locke's position with respect to the scope of knowledge more generally. There is widespread agreement that Locke thought that the

⁴⁰ For example, Peter Anstey has recently released a full-length monograph on the subject: Anstey 2011.

scope of knowledge was extremely limited and that humans are relatively ignorant creatures. But it seems to me that commentators have failed to understand precisely *why* Locke believes this. Specifically, past commentators have thought that Locke's views on our ignorance were grounded in problems to do with the representative nature of our ideas and the difficulty of getting beyond the veil-of-ideas.⁴¹ What the second part of this dissertation shows is that this is only part of the story. In fact, Locke's views on human ignorance are grounded in the belief that humans have very weak cognitive capacities and were not designed to know about the nature of reality.

Recognizing that this, rather than something about the nature of representation, grounds Locke's beliefs about human ignorance brings with it a number of advantages. The first is that it is better supported textually. The second is that it lets us better understand the scope and severity of human ignorance. If our ignorance were just a product of the nature of our ideas then it would seem to be something rather contingent about us. And, there would be no principled reason to restrict our inquiries. But once we understand that our ignorance is grounded in our limited cognitive capacities then we also understand that this ignorance is a necessary feature of our earthly state. It seems to me that only once we understand this can we have the right perspective on Locke's philosophy of science and on Locke's philosophy more generally.

So science will not uncover the secret inner workings of nature but it will yield us a lot of useful information and advantageous advances. To use Locke's example, by studying the Strasbourg clock we will never get to know what the inner mechanism looks like.⁴² But

⁴¹ For a recent example see Kim 2008, page 450.

⁴² See 3.6.3 and 3.6.9.

we will be able to know that the various chiming noises made by the clock and the movement of the star wheels correspond in set ways to the position of the hands on the clock face. In nature, we may never know the inner workings of plants and animals, but we will be able to learn that a plant turning a certain color corresponds to it being ripe (and safe or nutritious to eat) or that an animal making a particular sound corresponds to it preparing to attack.

6. An Outline of the Dissertation

This chapter has been meant as a general introduction. I have provided a brief overview of how I understand Locke's project in the *Essay*. I claim that Locke's goal is to describe the scope and contents of the human understanding. And I claim that his method is what Locke referred to as his "way of ideas." Following this I discussed the two main topics of the dissertation: causation and scientific explanation. With respect to causation I have motivated the thought that we should be looking for a psychology of causation, rather than a metaphysics of causation. With respect to scientific explanation I discussed the way in which many previous commentators have claimed that Locke offers a metaphysics of causation in the course of making claims about scientific explanation. I then explained that I will argue against this position and show that Locke's views on scientific explanation are governed by a certain form of epistemic humility.

In Chapters 2 and 3 I give my interpretation of Locke on causation. Chapter 2 addresses the ideas of power in Locke. Specifically, I argue for a distinction between a simple idea of power and complex ideas of specific powers. The simple idea of power is received in sensation and reflection. By contrast, specific ideas of powers (like magnetism or the power to break glass) are constructed by the mind. I show that we have both textual and philosophical reasons for recognizing this distinction in the *Essay*. I also show that

recognizing this distinction allows us to solve three exegetical problems that have troubled commentators.

Chapter 3 offers a new approach to Lockean relations. I argue that Locke was interested in the ways that the mind compares various ideas. According to my interpretation Locke thinks that when we think of any relation (for example, “X is bigger than Y” or “A is to the left of B”) the mind is comparing two of its ideas with respect to one of their constitutive ideas. I argue that this mental process is what Locke intends to describe when writing about relations. I contrast my approach with those who argue that Locke is attempting to offer a metaphysics of relations.

In Chapters 4 through 6 I discuss Locke’s views on scientific explanation. Previous commentators have claimed that while Locke does not offer a systematic account of causation in the *Essay* his remarks on scientific explanation commit him to certain causal views. The previous two chapters are meant to rebut the claim that Locke does not offer a systematic account of causation in the *Essay*. The following three chapters show that his views on scientific explanation do not commit him to strong views about the metaphysics of causation.

In Chapter 4 I examine the debate concerning the topic of “superaddition” in Locke. The debate asks whether all processes in nature are caused by the real essences of material objects or whether some material objects have divinely-granted causal powers unrelated to their essences. I argue that Locke was agnostic on this issue. He is committed to an epistemology which makes questions like these unanswerable for creatures like us.

Chapter 5 examines laws of nature in Locke. Some commentators have argued that Locke understands laws as fundamental causal components of reality. I argue that Locke

could not have accepted this. I show that this position is difficult to make clear and at odds with Locke's nominalism. I also sketch out an alternative interpretation of Locke on the laws of nature. On this alternative view laws of nature are just inductive generalizations.

Chapters 4 and 5 might leave one thinking that Locke takes an extremely dim view of science. Given that Locke thinks humans operate under severe epistemic limitations is there any hope for natural philosophy? Chapter 6 gives a detailed analysis of how Locke distinguishes between epistemically responsible and epistemically irresponsible scientific endeavors. More specifically, Chapter 6 focuses on Locke's attitude toward hypotheses in science. I argue that there are five criteria an hypothesis must meet before it is epistemically acceptable to Locke. I then show how Newtonian physics meets these five criteria.

2. Locke's Ideas of Power

1. Introduction

Locke's account of the idea of power has traditionally been thought to be plagued with difficulties. The goal of this chapter is to defend Locke's account. Previous interpreters have assumed that Locke employs only one idea of power. I will argue that Locke makes a critical distinction between (at least) two different types of idea of power. Further, I will argue that by deploying this distinction Locke can avoid several serious problems that previous commentators have found for his account.

My plan for the chapter is as follows. Section 2 examines the motivation for the chapter. It discusses some of the problems facing Locke's account and shows that they pose a very serious threat. Section 3 reviews Locke's important distinction between simple and complex ideas. Section 4 of the chapter argues for a distinction between the simple idea of power and complex ideas of specific powers and Section 5 shows how this distinction solves three problems for Locke. Section 6 considers two alternative approaches to these problems and shows that mine is preferable.

2. Why the Idea of Power Matters

Locke's account of the idea of power has received very low marks from commentators. According to them, Locke seems to have made some elementary mistakes in the taxonomy of the idea, and perhaps to have even contradicted himself by claiming that the idea is both simple and complex. Additionally, the relation between the idea of power and the ideas of cause and effect has been thought to be totally unclear. Which of these ideas is more fundamental? Or are they viciously interdefined? Most importantly, some have wondered whether Locke is even correct in claiming that we get an idea of power in experience. Hume seems to have shown that there is no idea of power in experience and, further, that the idea of power is completely unnecessary. So perhaps Locke's entire discussion of the idea of power is hopeless from the outset. Later in the chapter we will examine and evaluate these critiques in detail. But for the present moment it is worth examining just how serious these problems are.

Why should we care if Locke's account of the idea of power is confused and misguided? We should care because ideas of power are among the most important ideas in the *Essay*. To begin with, the chapter of the *Essay* specifically devoted to our idea of power, 2.21, is the longest in the book and underwent the greatest number of revisions. More importantly, several key doctrines of the *Essay* depend crucially on the idea of power. The account of free will and voluntary action is intimately connected to the idea of power.¹ The distinction between primary and secondary qualities also relies on the idea of power. This is because qualities are identified with powers: "the Power to produce any *Idea* in our mind, I

¹ 2.21.26 (first edition): "the *Idea* which the word *will* stands for, is a complex and mixed one, made up of the simple *Ideas* of Power, and a certain Mode of Thinking; and the *Idea* of *Liberty* is yet more complex, being made up of the *Idea* of a Power to act, or not to act, in conformity to Volition."

call *Quality* of the Subject wherein that power is.”² Understanding our ideas of power will also be central to understanding our ideas of particular substances. This is because so many of the constitutive ideas of those complex ideas of substances are ideas of powers.³ Finally, the idea of power is closely connected to Locke’s account of causation.⁴

Given all this, it should be clear that a consistent and coherent account of the idea of power will be necessary for any thorough understanding of Locke’s larger project. The critiques mentioned above allege that no such account is possible. I disagree. And in this chapter I show that unless we recognize a distinction between different ideas of power we will not be able to provide a clear and coherent interpretation.

3. Simple Ideas and Complex Ideas

Before examining the different types of idea of power it will be worthwhile to review the critical distinction between simple and complex ideas which Locke makes at the beginning of Book II. Simple ideas are simple in virtue of two things: 1) they are minimal or basic units of content and 2) they are not themselves composed of other ideas. Thus Locke writes that simple ideas “being each in it self uncompounded, [1] contains in it nothing but *one uniform Appearance*, or Conception in the mind, and [2] is not distinguishable into different *Ideas*.”⁵ Complex ideas, by contrast, are the result of the mind combining or compounding two or more simple ideas.⁶ So complex ideas admit of both complexity of

² 2.8.8.

³ 2.23.10: “*Powers*, therefore, justly *make a great part of our complex Ideas of Substances*.”

⁴ Causal processes are often explained by appeal to active and passive powers. See, for example, 2.21.1.

⁵ 2.2.1.

⁶ 2.12.1: “Combining several simple *Ideas* into one compound one, and thus all Complex *Ideas* are made.”

content as well as analysis into simple ideas. For example, I can discover that my complex idea of an apple is composed of the simple ideas of redness, sweetness, solidity, etc.⁷

Simple and complex ideas are also distinguishable on the basis of their origin. Locke believes that all and only simple ideas are received passively in experience, whether sensation or reflection. It would be impossible for the mind to create a simple idea which it had never experienced.⁸ By contrast, Locke believes that all and only complex ideas are actively constructed by the mind. So it would be impossible for us to receive a complex idea from experience.⁹

To quickly recap, there are two basic kinds of ideas: simple and complex. The simple ideas are received in sensation and reflection and are the basic mental units, both structurally and with respect to content. The complex ideas are not received in experience; instead they are constructed by the mind. The mind constructs these complex ideas by combining together various simple ideas. This means that the complex ideas are both complex with regard to structure and with regard to content. This distinction between simple and complex ideas is meant to be both exhaustive and mutually exclusive. This is to say that for any idea, that idea is either simple or complex. And no one idea can be both simple and complex.¹⁰

⁷ Of course, some of these ideas (redness, sweetness, etc.) might themselves be complex. All that matters is that each complex idea can eventually be analyzed into simple constituent ideas.

⁸ 2.1.6, 2.12.1, 3.4.11, and 4.11.4.

⁹ At 2.12.1 Locke's claim is that *all* complex ideas result from the mind's combining of simples into a complex. This is the counterpart of Locke's claim at 2.2.1 that all simple ideas "enter by the Senses simple and unmixed." Of course, the mind might be *disposed to unite* certain simples to others in virtue of the content of those simples or in virtue of how they were received. But this is different from the mind *receiving* complex ideas in experience. And, of course, we might not always notice the mind's combining of various simples into a complex. 2.9.8-10 (which contains Locke's response to the Molyneux Problem) is instructive in this regard.

¹⁰ Of course, many commentators think Locke failed to make this distinction clearly and consistently. Complaints have come from a number of directions; for a sampling see Aaron 1965, pages 110-114; Bolton 2007; and Stuart 2010. I do not think Locke failed to be clear or consistent in this regard. Indeed, an ancillary

4. Two Categories of Ideas of Power

My goal in this section is to show that when we apply Locke's claims about simple and complex ideas to his statements about the idea of power we are forced to recognize that Locke is speaking about (at least) two distinct types of idea of power.¹¹ One type I will call the Simple Idea of Power. The other type I will call Ideas of Specific Powers. I will first describe the two types of idea of power and highlight their differences. Following that, I will argue that Locke actually makes a distinction between these two types of idea in the *Essay*.

The Simple Idea of Power is absolutely simple, in the sense discussed in Section 3. As such, it is neither composed of other ideas nor does it admit of any conceptual analysis. It is a basic unit of content. As Locke says, in speaking about different simple ideas: "These like other simple *Ideas* cannot be described, nor their Names defined; and the way of knowing them is...only by Experience."¹² Given Locke's commitment to the unanalyzability of simple ideas, there is not a great deal more to be said about the intrinsic properties of the Simple Idea of Power. The way to examine simple ideas it to consider the complex ideas that they help to compose.¹³

Ideas of Specific Powers, by contrast, are complex ideas and so do admit of analysis. Examples of some Ideas of a Specific Power would include the idea of a magnet's power to

goal of this chapter is to partially redeem the simple/complex distinction by showing how it was correctly deployed by Locke in one instance and how it can assist him in responding to his critics.

¹¹ I say *at least* two because in addition to the simple idea and the complex idea I describe below, I think there is also a simple mode of power and an abstract idea of power.

¹² 2.20.1. Compare with a passage from one of Locke's notebooks from the mid-1670's which reads: "Simple Ideas cannot be defined, nor can we ever gain any notion of them by words." Ms. Locke f. 1, page 392.

¹³ For example, one might not get very far by just considering the simple idea of red, but *could* make some progress by analyzing her ideas of apples, strawberries, Santa's suit, cooked lobsters, etc. and realizing that the simple idea of red must be a component of these complex ideas.

attract iron filings or the idea of hemlock's power to kill humans. These ideas are distinct from the Simple Idea of Power because they contain some degree of complexity and thus admit of some analysis. For example, these ideas of powers are related to an idea of a substance (the magnet or the hemlock). Ideas of specific powers are also targeted toward a specific end. This is manifested in their relation to a distinct perceivable effect (the movement of the iron or the cessation of life).

So these are descriptions of two distinct types of idea, both of which could be referred to as the Idea of Power. But there still remains the question of whether Locke refers to both of these in the *Essay*. Put differently, did Locke intend to distinguish between these distinct ideas of power in the *Essay*? My answer is yes. One strategy for arguing this point would be to note a linguistic subtlety on Locke's part. Sometimes Locke writes about our idea of *power*.¹⁴ But other times Locke writes about our ideas of *powers*.¹⁵ Paralleling this difference is a difference in the use of an article. In the first type of passage Locke usually refers to *the* idea of power. But in the second type he usually refers to the idea of *a* power or the idea of *the* power *for x*. I think that in the first sort of passage he is referring to the Simple Idea of Power. And in the second type of passage he is referring to the Idea of a Specific Power. Of course, this linguistic point alone is insufficient to establish that Locke thought there are different kinds of idea of power. Nevertheless, I think it is a first step toward understanding the distinction in the *Essay*.

A much more important piece of evidence for the distinction is the existence of two different discussions of the idea of power in the *Essay*. The idea of power first gets

¹⁴ For example, 2.7.8, 2.22.10, and 3.6.11.

¹⁵ For example, 2.21.4, 2.21.18, and 2.23.7.

introduced and briefly discussed in 2.7 but there is also an introduction to the idea and an analysis at 2.21. My claim is that it is the Simple Idea of Power which is introduced at 2.7 and it is the Ideas of Specific Powers which are introduced at 2.21.

Why think that it is the Simple Idea of Power which is introduced at 2.7? One reason is that it occurs in what is an explicit discussion of simple ideas. The ideas which it is introduced alongside (pleasure, pain, existence, and unity) are unequivocally simple; Locke is never ambiguous about their lack of complexity. More important, though, is the fact that at 2.7 Locke has not yet even introduced the machinery for generating complex ideas. The conceptual possibility of a complex idea is simply unavailable in this chapter; it does not appear until 2.12. Further, Locke is very explicit in the 2.7 discussion that this idea of power is received from sensation and reflection. As such, it seems safe to conclude that the idea being discussed at 2.7 is the Simple Idea of Power.

But even if we accept this about 2.7, why think that the discussion later at 2.21 pertains to Ideas of Specific Powers? Why not think that Locke is continuing his discussion from 2.7 and that this is just another discussion of the Simple Idea of Power? I think there are several good reasons. First, the discussion at 2.21 makes no reference to the earlier presentation of the idea at 2.7. Locke normally mentions when (and often mentions where) something has been discussed previously. Second, 2.21 comes at a very different stage in the *Essay*. The machinery for generating complex ideas has now been introduced. And Locke has started into his cataloging and discussion of the different categories of complex ideas and the individual ideas that fall under those categories. This suggests that the kind of idea he would be keen to discuss in 2.21 would not be the same kind of idea that was introduced at 2.7.

Aside from these textual and structural considerations, there are good philosophical reasons for thinking that the idea introduced at 2.21 cannot be a second discussion of the Simple Idea of Power which was introduced at 2.7. The fact that, in the 2.21 discussion of power, we are able to differentiate between the different ideas of power we have suggests that they are complex. Locke very clearly thinks that some of the ideas discussed in 2.21 are active powers and some of them are passive powers. The fact that we can tell these classes apart suggests that they do not present us with “one uniform appearance” and that they admit of some sort of analysis.¹⁶

Or consider a different way of noticing the complexity of the Ideas of Specific Powers. Locke would say that many of the ideas which help to make up our idea of a baseball are ideas of the powers which the baseball has. It has the power to break panes of glass, the power to bruise flesh, the power to be cut in half by a saw, etc. But it is obvious that all of these ideas are different. The idea of the power to break glass is very different from the idea of the power to be cut in half by a saw. The fact that these ideas can be differentiated suggests that they have different content. But the only way to have different content, for Locke, is to be composed of different simple ideas.¹⁷

Given all of this, it seems reasonable to accept that Locke has two different types of idea of power at work in the *Essay*. But one pressing question must be answered before moving on and exploring the distinction further. Why, if these two types of idea of power

¹⁶ One might respond by arguing that perhaps Locke just believes there is a simple idea of active power and a simple idea of passive power. There are two responses to this. The first is to suggest that these do not seem to meet the standards for Lockean simplicity. Both seem to be composed of at least two components: 1) activity and 2) power, in the one instance, and 1) passivity and 2) power, in the other. The second, and I believe stronger response, is to note that there seems to be no textual support for this interpretation. It is incumbent on proponents of the view to provide some.

¹⁷ Strictly speaking, two ideas can also have different content by *being* different simple ideas. But it seems obvious that the idea of a baseball’s power to break a pane of glass is not a simple idea.

are really distinct, does Locke use the same word, namely “power”, to refer to each of them? Why are they both “the idea of power”? My answer is that the Simple Idea of Power is one of the simple ideas which helps compose the Ideas of Specific Powers, which are complex ideas; so the Simple Idea of Power is a necessary component of the Ideas of Specific Powers. In fact, it is the most salient component, a sort of *defining* component. It is because an Idea of a Specific Power has this special relationship to the Simple Idea of Power that Locke calls them both the idea of power.

We can draw an analogy here to Locke’s talk about substance in the *Essay*. Locke does think that we have an idea of substance-in-general which he calls our idea of substance.¹⁸ But Locke is very often happy to call our idea of an elephant or our idea of gold a substance, or (properly speaking) an idea of a substance. Why is this? The answer is that a critical component of our idea of gold or our idea of an elephant is that idea of substance: the idea of something holding up or supporting the perceivable qualities of the gold or the elephant.¹⁹ In fact, this idea of substance is one of the few things that the idea of gold and the idea of elephant have in common; it links them together and ensures they are taxonomized in the same group. So here we have a parallel instance of Locke using one term to refer both to a simple idea and a more complex idea which has that simple as a defining component.²⁰

5. Putting the Distinction to Work

¹⁸ Of course, questions about Locke on the idea of substance are very complicated and have spawned a large literature. I think, though, that nothing which follows is particularly controversial.

¹⁹ At 2.13.6 Locke writes that the confused idea of substance-in-general “is always the first and chief” idea in our complex ideas of specific substances.

²⁰ I have used substance as an example of this, but I believe examples could be multiplied. For example, there is a simple idea of reflection which is the idea of memory, but this simple idea plays a key role in my complex idea of remembering my last birthday party (a memory). Similarly, there is a simple idea of reflection which is the idea of volition, and this simple idea is a constitutive idea of my complex idea of electing to have chocolate ice cream rather than vanilla (a volition).

In the previous section I have argued that we have good reason to think that Locke had more than one idea of power in mind when he wrote the *Essay*. In this section I wish to show that this distinction between the simple idea of power and complex ideas of specific powers is a *productive* one. That is to say, I want to show that if we understand and accept this distinction we can avoid many of the problems that commentators have alleged Locke's account of the idea of power faces.²¹

There is a widespread consensus that Locke's account of our idea of power is deeply flawed. Criticisms have come from many directions, but I will focus on showing how the distinction between different types of idea of power can solve three of the most pressing problems which Locke allegedly faces. I do not believe that these three represent an exhaustive list of objections which one could give to Locke's account of our idea of power.²² Nonetheless, I think that overcoming these three objections is an important step toward understanding the idea of power in Locke's *Essay* and toward establishing that Locke has a consistent and coherent account. The first problem, which I will call the Simplicity Problem, concerns whether our idea of power is simple or complex. The second, which I will call the Circularity Problem, alleges a circularity between Locke's account of power and his account of causation. And the third, which I will call the Origin Problem, asks whether it is possible to get an idea of power in experience. I shall discuss each problem in turn.

5.1 The Simplicity Problem

²¹ If the distinction is helpful in solving problems for Locke then this should provide us with additional evidence that Locke intended to make the distinction. This can serve as a sort of bootstrapping argument in favor of the distinction.

²² Other lines of objection might include the claim that the idea of power could never be acquired in experience because it plays the role of a (Kantian) category and must be either innate or deduced rationally (see Fraser 1959, volume 1, page 308 note 1 and page 311 note 7 and Yolton 1968) or the worry that Locke's remarks on the idea of power fail to specify a clear view of the metaphysics of powers.

The first complaint about Locke's account of power is also the most widespread. This complaint is that Locke's writings are ambiguous as to whether the idea of power is simple or complex. Usually, Locke asserts that our idea of power is a simple idea. Most explicitly, 2.7.1 lists power (along with pleasure, pain, existence, and unity) as one of the simple ideas which we receive both from sensation and from reflection. And later in the chapter we read that "*Power* also is another of those simple *ideas*, which we receive from *Sensation and Reflection*."²³ And at 2.21.3 Locke claims that "Our *Idea* therefore of *Power*, I think, may well have a place amongst other simple *Ideas*, and be considered as one of them..." Passages at 2.18.6 and 2.22.10 also strongly imply that the idea of power is simple.²⁴ So most of Locke's usages seem to support the claim that he thought the idea of power was a simple idea.

But on at least one important occasion, Locke seems to say that the idea of power is complex: "Powers, considered in themselves, are truly complex *Ideas*."²⁵ Many have thought that this passage calls into question Locke's other assertions that the idea of power is simple.²⁶ In context, this passage reads "Powers, considered in themselves, are truly complex *Ideas*. And in this looser sence, I crave leave to be understood, when I name any of these *Potentialities amongst the simple Ideas*, which we recollect in our minds, when we

²³ 2.7.8.

²⁴ 2.18.6: "yet some others of the simple ideas, viz. those of unity, duration, and motion, &c., above instanced in, as also power and thinking, have been thus modified to a great variety of complex idea, with names belonging to them." 2.22.10: "It is worth our observing, which of all our simple ideas have been *most* modified...and those have been these three: --*thinking* and *motion*...and *power*." Locke also lists power as a simple idea in a shorthand note from 1676 on 'Pleasure, Pain, the Passions.' The passage is printed at Locke 1997, pages 243-245.

²⁵ 2.23.7.

²⁶ For example, Block 1971, pages 9-10, 19-20; Mabbott 1973, page 37; Chappell 2007, pages 131-132.

think of *particular Substances*.”²⁷ So here Locke may be taken as suggesting that when he refers to the idea of power as simple he is not speaking in a rigorous manner. Ideas of power are not in themselves simple, but they are simpler than the complex ideas of substances which they help to constitute. So although the majority of passages suggest that the idea of power is simple, this passage has given some commentators reason to question Locke’s precise meaning in those other passages.

To add to the confusion, some of Locke’s statements about the idea of power are simply noncommittal with regard to whether it is simple or complex. Consider 2.23.9 where he writes: “...these are called active and passive Powers: all which Powers, as far as we have any Notice or Notion of them, terminate only in sensible simple *Ideas*.” This could either mean that each specific active or passive power *is* a simple idea (using “terminate” in the sense of “refer to”) or it could mean that each specific active or passive power is composed of simple ideas (using “terminate” in the sense of “analyzes into” or “results in”).²⁸ And at 2.23.35 Locke writes about some of the ideas which comprise our complex idea of God: “Existence, Knowledge, Power, Happiness, *etc.* infinite and eternal: which are all distinct *Ideas*, and some of them being relative, are again compounded of others...” Here Locke fails to specify whether the idea of power is, like existence,²⁹ a truly simple idea or whether it is, like knowledge,³⁰ relative and therefore actually complex.

²⁷ 2.23.7.

²⁸ These usages of “terminate” are now somewhat antiquated, but would have been common in the 17th century.

²⁹ 2.7.1 and 2.7.7 have existence as a simple idea received from sensation and reflection.

³⁰ 4.1.2 has it that knowledge consists in the perceived connection between ideas, which seems to imply (at least) two ideas and therefore complexity.

Another text which has helped give rise to the Simplicity Problem comes at 2.21.3. Here Locke writes: “I confess *Power includes in it some kind of relation*, (a relation to Action or Change)...” A similar passage occurs at 2.31.8 where Locke says that the ideas of powers in substances are simple ideas, but then that they are relations. Claiming that our ideas of powers either are or contain ideas of relations implies that they are complex ideas. This is because Locke is clear that our ideas of relations are complex ideas.³¹ And no simple idea can contain any other idea, let alone a complex one. So, according to proponents of the Simplicity Problem, the passages in which Locke says that the idea of power contains a relation are in tension with the passages in which he says that it is a simple idea.

There is one more issue that is relevant to the Simplicity Problem. This has to do with the genesis of our idea of power. Locke believes that all and only simple ideas are received from experience, whether sensation or reflection; it would be impossible for the mind to create a simple idea which it had never experienced.³² Locke also believes that all and only complex ideas are constructed by the mind; so it would be impossible for us to receive a complex idea from experience.³³ So Locke’s remarks on the origin of this idea are relevant to determining whether it is simple or complex.

The problem is that Locke’s language about the idea of power has seemed to some to be ambiguous as to its origin. 2.7.8 says that power is received in sensation and reflection. This suggests that power is a simple idea, received passively. But 2.21.1 seems to pull in the other direction. Here Locke says that the mind must make conclusions from observed

³¹ 2.12.3, 2.12.7, 2.25.9, and 2.29.1.

³² 2.1.6, 2.12.1, 3.4.11, and 4.11.4.

³³ 2.12.1 has Locke claiming that *all* complex ideas result from the mind’s combining of simples into a complex.

changes, and then consider those changes in objects before we get the idea of power; so the idea of power looks to be actively constructed. The thought that processes of ratiocination are required to get the idea of power suggests that the idea of power is a complex idea. This puzzle might sound familiar to attentive readers of Hume.³⁴ Hume reads Locke as claiming that the idea of power is simple, but also that it is constructed by the mind. Hume is right to note that if this is Locke's position, then it is deeply problematic.

One of Locke's primary goals in the *Essay* is to show how it is that all human thought consists in ideas and that all of these ideas are reducible into simple ideas of sensation and reflection. If proponents of the Simplicity Problem are correct and Locke does display an inability to determine whether the idea of power is simple or complex then the Simplicity Problem calls into question the feasibility (or even worse, the possibility) of the Lockean project. If the idea of power is complex, then we are owed an account of which simple ideas comprise it. But we cannot tell if this project of analysis into simples is even necessary until we determine whether the idea is complex or not.

5.2 Solving the Simplicity Problem

The Simplicity Problem is the easiest of the three problems to dispatch once the distinction between the Simple Idea of Power and the Ideas of Specific Powers is up and running. The Simplicity Problem alleges that Locke vacillates over whether the idea of power is a simple idea or a complex idea. In short, the solution is to argue that *the* idea of power is neither simple nor complex because there is no one idea of power. The Simple Idea

³⁴ Hume 1999, page 137, note 12: "Mr. Locke, in his chapter of power, says, that, finding from experience that there are several new productions in matter, and concluding that there must somewhere be a power capable of producing them, we arrive at last by this reasoning at the idea of power. But no reasoning can ever give us a new original, simple idea; as this philosopher himself confesses. This, therefore, can never be the origin of that idea."

of Power is simple and each Idea of a Specific Power is complex. Understanding this will allow us to make sense of the passages in which Locke seems to straightforwardly vacillate over whether the idea is simple or complex.

But what about the other ways of motivating the Simplicity Problem? There was also Locke's alleged vacillation over whether the idea contained a relation or not and his alleged vacillation over whether it was received in experience or constructed by the mind. Again, the solution is to admit that Locke is committed to all four of these things, but to ask which idea of power he was speaking about in each instance. With regard to relations, Locke thinks that the Simple Idea of Power is absolutely simple; it does not contain a relation. When Locke writes that an idea of a power contains (or is) a relation, he is speaking about an Idea of a Specific Power. These ideas are complex and there is no obstacle to them containing a relation. With regard to the Simple Idea of Power, Locke thinks that it is received in sensation and reflection, as the discussion in 2.7 makes clear. With regard to the 2.21 passages in which Locke suggests that the idea of power is constructed by the mind he is discussing Ideas of Specific Powers. Ideas of Specific Powers are complex and Locke thinks that all complex ideas are constructed by the mind. Thus Locke is right to hold that each Idea of a Specific Power is constructed by the mind.

So Locke does not equivocate over whether the idea of power is simple or complex. He thinks there are two distinct categories, one of them contains the simple idea of power and the other contains ideas of power which are complex.

5.3 The Circularity Problem

The next problem with the account of the idea of power has to do with its relation to our ideas of cause and effect. Michael Ayers has suggested that providing separate accounts

of these ideas will “invite the charge of circularity.”³⁵ His suggestion is that the account of the idea of power’s origin presupposes causal concepts. Seemingly, one could not have an understanding of what a power was unless she understood that it was a power to produce a given effect. But understanding the production of an effect is the same as understanding what it is to cause something.³⁶ Similarly, it would be hard to say that an agent understood what it was for X to cause Y if she did not understand that X had a power to produce Y. The conceptual connections between “power” and “causation” run extremely deep. As such, there is a question about whether they can be defined non-circularly.

Part of the motivation for Ayers’ claim comes from observing that the language Locke uses to introduce the idea of power is quite similar to the language he uses to introduce his discussion of cause and effect. Compare 2.21.1 with 2.26.1. The first reads “The Mind, being every day informed, by the Senses, of the alteration of those simple *Ideas*, it observes in things without; and taking notice how one comes to an end, and ceases to be, and another begins to exist, which was not before...” The second reads “In the notice, that our Senses take of the constant Vicissitude of Things, we cannot but observe, that several particulars, both Qualities, and Substances begin to exist; and that they receive this their Existence, from the due Application and Operation of some other Being. From this Observation, we get our *Ideas* of *Cause* and *Effect*.” The two passages seem markedly similar. And both accounts seem to presuppose an understanding of what it is for one thing to produce another, or for one thing to have the power to affect another.

³⁵ Ayers 1991, page 163. Ayers makes a similar charge of circularity in Ayers 1975, pages 5-6.

³⁶ Assuming, along with most of the early moderns, that efficient causation is the relevant type of causation.

Of course, not all circularities are vicious. Just showing that there are deep conceptual connections does not show that Locke has a problem. Many philosophers have been happy to assert that several of our most primitive terms are interdefinable with none being more fundamental than any other (possible candidates might include reality, existence, actuality, truth, meaning, etc.). So why would this sort of circularity be a problem for Locke in particular? I think the answer to this question has to do with the empiricist goal of Locke's project. Locke set out to show how all of our ideas are comprised of simples received from experience. Given this, when asked which simpler ideas comprise our idea of a power and which simpler ideas comprise our idea of a cause, Locke cannot invoke the idea of a cause in the first place and the idea of a power in the second without involving himself in an infinite regress. Put differently, Locke is committed to grounding our ideas in experience and to explaining which of our ideas are the simple ones.

So Locke must choose one or the other idea to be the simpler. Either ideas of causes contain ideas of powers or ideas of powers contain ideas of causes. He simply cannot have it both ways. Unfortunately, Locke does not seem to take a decisive stand on this issue. There is no clear indication that he took either as primary. And the texts quoted above might support the idea that he saw them as inter-defined. If this is the case then his account of power is deeply flawed. What we get is an "embarrassed attempt to bring some awkward abstract concepts under the principle that all our ideas come from experience."³⁷

5.4 Solving the Circularity Problem

³⁷ Ayers 1975, page 6. While my presentation of this problem has focused on Ayers it is worth noticing that Mattern 1980, page 48 presents similar worries: "Perhaps [Locke] was disturbed to find, as he began to write about the origin of the ideas of power and cause, that it was natural to describe our experience in ways which already presuppose these ideas. It would not be surprising if Locke felt some conflict between the desire to set forth a very simple version of empiricism, and the realization of the need for qualifying this version in ways that could play into the hands of his opponents, the believers in innate ideas."

The primary concern motivating the Circularity Problem is the thought that Locke's account of power and his account of causation are going to be viciously interdefined. The interdefinition will be vicious insofar as neither will be more basic than the other and Locke's project of grounding out all of our ideas into simples will be endangered. Understanding that there are two ideas of power in the *Essay* should help to assuage these concerns.

Specifically, if we understand that the Simple Idea of Power is (absolutely) simple then we can be assured that our ideas of causation and power do have a basis at the fundamental level of experienced simple ideas. The Ideas of Specific Powers have the Simple Idea of Power as a component, and our ideas of cause and effect also have the Simple Idea of Power as a component. As long as Locke is able to show that all of our complex ideas are composed of simple ideas received in sensation and reflection then his empiricism will be safe.

But what about the considerations used to generate the Circularity Problem? Why is it that the ideas of power and causation seemed to be interdefined? I think that answering this question requires recognizing the difference between a *description* of an idea and an *analysis* of an idea. One of Locke's standard moves in the *Essay* is to first describe an idea before analyzing it. The description of an idea is an attempt to get the reader to identify and locate a given idea in his or her understanding. An analysis, by contrast, is an attempt to show which simples comprise the idea in question (an attempt to specify the compositional structure of the idea). For example, to *describe* the idea of a rose one might mention that it is an idea that comes to mind when one thinks about a flower often alluded to in poetry, a present given by the dozen on Valentine's Day, and a national symbol of England.

Mentioning these things would help an interlocutor to search through her mental inventory and single out her idea of a rose. Following this, one might offer an analysis of that idea in an attempt to show that all its constituent ideas are received in sensation and reflection. For example, the complex idea of a rose is made up of the simple ideas of red (on the petals), green (on the stem), a particular smell, the idea of pain from touching the thorns, etc.

I think we can now see where the confusion arises in the case of causation and power. A *description* of one idea would very likely require the mention of the other. In fact, a description of either that left the other out would be incomplete. But this does not mean that an *analysis* of either must include the other. And the mere fact that the analysis of both includes some third idea (the Simple Idea of Power) is not problematic. Consider a parallel case. An empiricist might mention Venus while describing her idea of the Morning Star, and vice versa. And, in fact, if one wants an interlocutor to focus on her idea of the Morning Star, mentioning the planet Venus will be very helpful. But in analyzing her complex idea of the Morning Star the empiricist need not mention her complex idea of Venus. And in analyzing her idea of Venus she need not mention her complex idea of the Morning Star. And this is true even though both will contain many of the same simple ideas: the idea of white, the idea of such-and-such distance from the Sun, etc. So although the two ideas are closely related, they need not be defined circularly and therefore will cause no trouble for an empiricist like Locke.

5.5 The Origin Problem

The Origin Problem is, to my mind, the most serious and perhaps most philosophically interesting problem facing Locke's account of the idea of power. This problem alleges that Locke finds something in experience which is simply not there. In a

post-Humean context this problem is easy to motivate. As is well known, Hume undertook an extended search to locate anything like the idea of power in experience. The results of this search were negative. There simply is no idea of power. So, according to this argument from phenomenology, Locke has improperly imported a false or fictitious idea into our thinking.³⁸

Of course, if Hume had been entirely original in emphasizing the implausibility of a perceived idea of power, then perhaps Locke could be excused for having included one. After all, Locke never had the privilege of reading Hume. But the fact is that on this point Hume was not original and was, in fact, drawing on a long tradition of arguing that this idea of power is elusive. A series of seventeenth-century French thinkers had all problematized, in one way or another, the thought that we receive an idea of power from experience. This occasionalist tradition was very familiar to Locke. He owned the works of Geraud de Cordemoy, of Louis de la Forge, and most importantly, he had made a careful study of the works of Nicolas Malebranche. So Locke was aware that the idea of power was problematic and that many had denied that it could be found in experience.³⁹

The Origin Problem is exacerbated by the fact that Locke does seem to admit that it has some validity. Several passages from 2.21 suggest that he was sympathetic to arguments of the type advanced by French occasionalists. Consider the following two quotes: 1)

³⁸ It is worth noting that recent years have witnessed a change in philosophical climate. New psychological research and new philosophical argumentation have helped revive the anti-Humean view that causal powers are, in fact, perceived. It may also be worth noting that the anti-Humean position never completely died out. Elizabeth Anscombe, David Armstrong, and a host of non-Anglophone philosophers (especially those writing in the wake of Kant) all endorsed the view that something like the idea of power is received in experience.

³⁹ For the occasionalist literature Locke owned see Harrison and Laslett 1971, page 116 (Cordemoy), page 137 (de La Forge), and pages 182-183 (Malebranche). The careful study of Malebranche is reflected both in his posthumously published *An Examination of P. Malebranche's Opinion of Seeing All Things in God* and in notes in Locke's journals (for example, Ms. Locke c. 28, folio 159r and 159v).

“Whether Matter be not wholly destitute of *active Power*, as its Author GOD is truly above all *passive Power*... may be worth consideration.”⁴⁰ 2) “But yet, if we will consider it attentively, Bodies, by our Senses, do not afford us so clear and distinct an *Idea* of *active Power*, as we have from reflection on the Operations of our Minds.”⁴¹ Locke goes on to describe the scenario of a billiard cue moving a ball and that ball colliding with a second ball and moving it away. He says that these events give “us but a very obscure *Idea* of an *active Power* of moving in Body.”⁴² In these passages Locke seems to admit that getting our idea of power from bodies will be either difficult or impossible.

All of this might seem deeply problematic for Locke. Locke argues that we get our idea of power from sensation but there are arguments that no such idea can be gained from the observation of material objects. And Locke recognizes that material objects are “destitute” of active power, yet he still claims that our ideas of active powers help to make up our ideas of substances. Locke seems to be in a bind, either the idea of active power has no origin in experience, in which case Locke has abandoned his empiricism or the idea of an active power is one we can have with mental acts, but not with physical ones, in which case Locke has, without justification, imported the idea into a domain where we have no empirical reason for thinking it belongs.⁴³ If either of these scenarios is the case, then Locke’s account of power is seriously flawed.

⁴⁰ 2.21.2.

⁴¹ 2.21.4.

⁴² 2.21.4. Locke here uses the word “obscure” in the technical sense discussed at 2.29.

⁴³ Hume may have Locke and the second horn of this dilemma in mind at 1.3.14.12 of the *Treatise*: “Some have asserted, that we feel an energy, or power, in our own mind; and that having in this manner acquir’d the idea of power, we transfer that quality to matter, where we are not able immediately to discover it.” Hume 2000, page 108.

So there are pressing questions pertaining to the idea of power's origin. Where does the idea come from? Is it consistent with a rejection of innate ideas? Do ideas of active powers belong in our ideas of material substances? Why or why not? Many have thought that these are questions for which Locke has no clear answers.

5.6 Solving the Origin Problem

Recognizing the distinction between two different ideas of power will allow us to neatly solve the Origin Problem. The Origin Problem asks whether there is any basis in our experience for the idea of power and asks whether Locke was justified in putting ideas of active power into ideas of substances. My position is that Locke thinks we only get one type of idea of power in experience but that Locke can still offer a satisfactory explanation of the presence of the other type of idea of power in our ideas of material objects.

Consider the sorts of "billiard ball" scenarios which are normally conjured up to support the intuition that there is no idea of power received in experience. The thought here is that it is deeply implausible that one of the things I see when I see one billiard ball smash into another and cause it to move away is one's *active power to move the other*. Instead, what I see are two distinct movements which are spatiotemporally conjoined. So far so good. But now that we understand that Locke has two different categories of power ideas, I do not think that we should read him as committed to the implausible claim that the complex idea of a billiard ball's active power to move another billiard ball is ever the sort of thing which is directly acquired in experience. This sort of complex idea of power is an Idea of a Specific Power; like all complex ideas, it is constructed by the mind. So it may be the case that, in experience, we never get this idea. All Locke needs to assert is that when the mind is

constructing its ideas of billiard balls, it builds in this idea of a power to move other billiard balls.

Of course, Locke disagrees with Hume insofar as he thinks that we do get *some* idea of power in experience, but understanding that the idea of power we get in experience is the Simple Idea of Power should make his position far more plausible.⁴⁴ First, however, we must ask whether Locke and Hume are discussing the same idea. Hume often writes as though the simple idea of power is identical to the idea of a necessary connection.⁴⁵ This suggests that Locke and Hume may be talking past one another. Given Locke's standards for the simplicity of simple ideas the idea of necessary connection could not be the same as (what Locke calls) the simple idea of power; it contains, at least, two distinguishable elements: 1) necessity and 2) connection. Locke and Hume are in complete agreement that the idea of necessary connection is not an idea received in experience.

But presumably even if Hume were corrected on this point he would still deny that *any* simple idea of power is received in sensation. Here, it seems to me, Locke and Hume are just disagreeing about which items are necessary to account for human experience and understanding. Consider Locke's response to another early modern with whom he disagreed about the elements of our experience. Descartes denied that we get any idea of solidity in experience; his view was that the idea of extension was sufficient to account for our experiences of and our understanding of material bodies. Here is part of what Locke has to say in response: "If any one asks me, *What this Solidity is*, I send him to his Senses to inform

⁴⁴ For an alternative discussion of the relation between Locke and Hume on the idea of power see Coventry 2003. Because Coventry does not recognize the distinction between the Simple Ideas of Power and Ideas of Specific Powers she concludes that Locke's account is deeply flawed in just the way Hume suggested.

⁴⁵ I think Hume's emphasis on necessary connections (a phrase which almost never occurs in Locke's *Essay*) is evidence that Malebranche's views provide as much of the background for Hume's discussion as Locke's do.

him: Let him put a Flint, or a Foot-ball between his Hands; and then endeavour to join them, and he will know.”⁴⁶ Locke’s point is that if we are going to make sense of our experiences of pressing rocks or footballs we need more than just an idea of extension; we must also make appeal to an idea of solidity. Similarly, Locke seems to believe that if we are to make sense of our experiences of willing to raise our arm or having a football hit us in the leg, we must make appeal to more than just our ideas of desire and the arm’s motion or our ideas of the football and pain. Given the highly structured content of these experiences an idea of power is a necessary component.

Of course, Hume will still disagree. But now the disagreement between Locke and Hume is a familiar one; and one in which Locke is not obviously in the wrong.⁴⁷ Locke believes that we understand causal processes as robust phenomena and Hume opts for a more deflationary understanding. Hume’s account is more parsimonious insofar as it does not have to make appeal to the additional idea of power; it gets by with fewer ideas. But Locke is in good company in thinking that Hume’s account simply lacks sufficient explanatory power. Hume lacks the explanatory resources for making sense of our complex experiences of causal processes.

My hope is that this way of approaching the issue makes Locke’s position look more coherent and more explanatory. There is a simple idea which is received in sensation (and reflection), and a more complex idea which is not received while experiencing any causal interaction but which is instead constructed by the mind (perhaps after experiencing a great number of causal interactions). But there is still the matter of Locke’s apparent admission

⁴⁶ 2.4.6.

⁴⁷ I do not mean to suggest that Locke is obviously in the right either, just that there is a reasonable dispute here.

that matter contains no active powers. What are we to make of this? I think that a careful examination of the text can help to remove some of the confusion on this point.⁴⁸

The first question to ask is whether Locke actually commits himself to any metaphysical thesis in the relevant passages. Locke writes that “*Power* thus considered is twofold, *viz.* as able to make, or able to receive any change: The one may be called *Active*, and the other *Passive Power*. Whether Matter be not wholly destitute of *active Power*, as its Author GOD is truly above all *passive Power*; and whether the intermediate state of created Spirits be not that alone, which is capable of both *active* and *passive Power*, may be worth consideration.”⁴⁹ As noted above, this passage is often offered as evidence that Locke thinks that matter has no active powers. But I think it offers no such evidence, all Locke says is that it “may be worth consideration” whether this is the case.⁵⁰ I think that Locke here is merely noting that there is a vibrant seventeenth century debate about the nature of matter, and that one popular position (the occasionalist one) holds that matter lacks active powers. But he himself does not intend to take a firm position on this debate.

⁴⁸ Mattern 1980 also examines these texts in an effort to provide a charitable reconstruction. Mattern fails to recognize the distinction between the two types of idea of power and is therefore unable to provide a fully satisfactory interpretation; according to her account Locke’s statements on the matter are “confused and unclear” (page 48).

⁴⁹ 2.21.2. Tellingly, in an earlier draft of the *Essay* Locke wrote this passage in the margin after crossing out a different passage. The crossed out passage read “If we would consider them aright we should I suppose finde that [active power] is soely in God and not at all in creatures and [passive power] soely in the creatures but not at all in God. For I thinke it is a cleare truth that God alone has power to change all other things but is not capeable of any change in himself. And that all the creatures are capeable of change but have not in themselves an active power to produce it.” Draft C 2.25.3. This clearly suggests that Locke had occasionalism on the mind as he worked through these issues. And his rejection of this (still conjectural but stronger) position and replacement with the more humble opinion shows that he shied away from the metaphysical disputes present in the original passage. See Mattern 1980, pages 62-63 for further discussion of this point.

⁵⁰ Importantly, Locke uses similar language (“it is worth our consideration”) when discussing the same issue at 2.23.28.

Second, if we accept the above argument that (in this passage) Locke is not interested in making a metaphysical claim we might wonder what he *is* up to. Fortunately, the sentences which follow help: “I shall not now enter into that Enquiry, my present Business being not to search into the original of Power, but how we come by the *Idea* of it. But since *active Powers* make so great a part of our complex *Ideas* of natural Substances, (as we shall see hereafter,) and I mention them as such, according to common apprehension...”⁵¹ Here we have Locke explicitly saying he is uninterested in the debate over whether matter is passive (he will not “enter into that Enquiry”). Instead, what *does* interest Locke is our idea of power and the role it plays in our thoughts. And he thinks that for most of us, ideas of active powers make up a huge portion of our ideas of material objects (they do “according to common apprehension”).

I think Locke’s thought here is as follows. When we are speaking about metaphysics it might be worth considering whether matter is wholly passive. If we decided it was, and elected to become very strict occasionalists, we would then need to work hard to excise ideas of active powers from our idea of material objects. But the fact is that most of us are not strict occasionalists. The average non-philosopher never wonders whether her ideas of material objects are metaphysically adequate. And even philosophers, most of the time, slide into non-philosophical ways of thought. So perhaps one might want to take issue with Locke on metaphysical grounds and argue that he has built illegitimate ideas of power into our ideas of material objects. To this, Locke can reply that while there is an interesting debate to be had about whether our ideas of material objects *should* contain ideas of active powers this is irrelevant to his point in this chapter. His goal is to describe the human understanding; he

⁵¹ 2.21.2.

wants to explore the ways in which (most) people use the idea of power and where the idea of power occurs in their thought, not to dictate the proper way to think about material objects.

6. Alternative Approaches

Before concluding, I want to briefly discuss two other ways of approaching the Simplicity, Origin, and Circularity Problems. The first approach argues that Locke has two different notions of simplicity at work in the *Essay*. The second approach argues that Locke was simply uninterested in offering a coherent account of our idea of power. My contention is that neither of these proposed solutions is satisfactory, both fail to adequately address the challenges posed by these problems.

6.1 Relative Simplicity

The first proposed solution argues that Locke has two different notions of simplicity at work in the *Essay*.⁵² More specifically, the suggestion is that Locke employs a notion of relative simplicity as well as a notion of absolute simplicity. The absolutely simple ideas are those that are minimal units of content and those which do not analyze into further ideas. The relatively simple ideas are complex ideas which are simpler than the larger complex ideas which they help to constitute. Not all relatively simple ideas are absolutely simple ideas. For example, my idea of the Oval Office is a complex one (it contains ideas of the President's desk, sofas, portraits on the wall, the flag, etc.). But my idea of the Oval Office is less complex than my idea of the White House, which also contains ideas of the Lincoln

⁵² Ott 2009, page 169. It is perhaps worth noting that Descartes develops and deploys a notion of relative simplicity in his *Regulae*, particularly in Rule 6. Descartes 1985, pages 21-24. Many commentators (for example Aaron 1965, pages 220-221) have thought that the *Regulae* had a rather direct effect on some aspects of Locke's thinking. But for a dissenting view see O'Kelley 1971.

Bedroom, the East Room, etc. But my idea of the Oval Office is part of my idea of the White House. As such, it is fair to say that while my idea of the Oval Office is not an (absolutely) simple idea it is a (relatively) simple idea insofar as it helps to comprise my (much more complex) idea of the White House.

It is clear that the notion of relative simplicity does have a place in the *Essay*. And I think that it must be the case that sometimes when Locke refers to the idea of power as a simple idea he must mean that it is simple relative to the substance it helps to compose. For example, the passage cited above from 2.23.7 can best be made sense of by admitting this notion of relative simplicity. Here Locke writes that “active Powers, and passive Capacities; which though not simple Ideas, yet, in this respect, for brevity’s sake, may conveniently enough be reckoned amongst them.” As Locke’s examples in the passage make clear, he means to suggest that these ideas are (relatively) simple with respect to the complex ideas of substance which they help comprise. This notion of relative simplicity will also help later in this passage when Locke says that in referring to these ideas which are actually complex as simple he is using a “looser sence” of the word.

But while this distinction is helpful for reading some passages, it is far from clear that it can be used in all the places where Locke writes that the idea of power is a simple idea, and it is far from clear that a distinction between different senses of simplicity will be sufficient to solve all the problems facing Locke’s account of our idea of power. For example, when Locke refers to the idea of power as simple during his initial introduction of the idea of power at 2.7 he can only be read as meaning absolute simplicity. In these passages he could not mean that the idea of power is only relatively simple. Recall that in these passages the idea of power is introduced alongside unequivocally absolutely simple ideas, is claimed to be

acquired in sensation and reflection, and that at 2.7 the machinery for discussing complex ideas is not yet introduced. And even apart from the textual evidence in 2.7, it is unclear how the challenge posed by the Origin Problem, for example, could be solved through an appeal to relative simplicity.

6.2 Taxonomic Neglect

A second response is to just attribute these difficulties to a systematic taxonomic failure on Locke's part. This approach is exemplified by Michael Jacovides.⁵³ Jacovides believes the existence of problems like these motivate two claims. The first is that Locke's discussion of the idea of power "reflects a studied neglect of taxonomy."⁵⁴ The second is that the discussion points to "complications in Locke's conception of simple ideas."⁵⁵ Jacovides claims that the idea of power can best be understood as a simple mode; he believes that had Locke gone this route the problems he faces would, in large part, disappear. Jacovides asserts that we should not much mind Locke's taxonomical errors because Locke simply does not care very much about taxonomy. Instead, Locke found himself immersed in interesting philosophical problems and let his taxonomy and theory of ideas fall to the side.⁵⁶

I believe that there are convincing textual, philosophical, and methodological reasons for rejecting Jacovides' view. And in the rest of this section I will discuss them. Before moving on, however, I should clarify that I do think that Locke allows for a simple mode of

⁵³ Jacovides 2003.

⁵⁴ Jacovides 2003, page 330.

⁵⁵ Jacovides 2003, page 330. Jacovides actually thinks that these problems also show a "an ambiguity in the notion of capacity" but I have left this aside as irrelevant for present purposes.

⁵⁶ Jacovides 2003, pages 335-336. I say that this approach to the problems is exemplified by Jacovides because, as noted above, many commentators, partly for reasons having to do with the idea of power, see serious problems with Locke's simple/complex idea distinction and his taxonomy of ideas more generally.

power. But I do not believe that Locke is primarily discussing the simple mode of power at 2.21. And I disagree with Jacovides about how that simple mode is constructed. On my view, the simple mode of power is constructed out of simple ideas of power. So the simple mode of power is something like a quantity of pure power. I think Locke most commonly refers to the simple mode of power in theological contexts when discussing God's power (or God's might, if that sounds more natural).⁵⁷ The idea of God's immense power seems to be constructed merely by aggregating simple ideas of power.⁵⁸ So Jacovides and I agree that there is a simple mode of power. But we disagree about where it is discussed and what it looks like. I will now turn to some textual concerns.

There are two textual difficulties for Jacovides' view. Recall that Jacovides thinks Locke simply did not care very much about taxonomy and the theory of ideas. According to him, Locke became engrossed in fascinating philosophical problems (in the case of 2.21 the problems of free will and voluntary action) and ignored his program of taxonomizing and explaining our ideas. I think there are passages which motivate against this view. Locke acknowledges that he is working systematically in 2.21 and that he understands the idea of power to be intimately related to his discussion of free will.

First, Locke gives us some indication in the *Essay* that he is working systematically. The relevant passage comes at the very end of the chapter on power. In this passage Locke suggests that the discussion of free will "came naturally in my way."⁵⁹ We can gain some

⁵⁷ See, for example, the discussion of power at 2.26.6. See also §15 of the *Remarks on Norris*, Locke 1823, volume 10, page 255.

⁵⁸ See, for example, and 2.23.33 and 3.6.11. Note that in the first of these passages Locke suggests that in constructing our idea of God we first aggregate together our ideas of *power* and then later, as a separate step, add in many other ideas of *powers*. Thus, this passage seems to be an instance in which Locke is using both simple and complex ideas of power.

⁵⁹ 2.21.72.

insight into what Locke means by “his way” by looking at the first edition of the *Essay*. In this edition Locke explains that the ideas of will, volition, liberty, and necessity are all complex ideas which contain the idea of power. Locke suggests that although the long discussion of the will might be a “transgression, against the method I have proposed to my self” it is justified because discussion of these topics “sprang up from their proper roots.”⁶⁰ My suggestion is that Locke’s mention of “his way” is almost certainly a reference to his “way of ideas” and his mention of the “method” he set for himself refers to the examination of all the mind’s ideas, the demonstration of how they fit into the classification he has outlined, and the illustration of the claim that all ideas reduce to simple ideas.

The second passage relevant to this point comes from a letter to William Molyneux, one of Locke’s close correspondents with whom he often discussed the structure of the *Essay* and plans for revisions. In this letter Locke says that when he began to think about the idea of power he had no intention of discussing free will. And, that even after considering the issue he thought about leaving his discussion of free will out of the *Essay*. He writes that “When the connection of the parts of my subject brought me to the consideration of power, I had no design to meddle with the question of liberty, but barely pursued my thoughts in the contemplation of that power in man of choosing or preferring...”⁶¹ This passage suggests that Locke actually was interested in the idea of power, that the idea of power was the motivating

⁶⁰ First Edition 2.21.46: “Will, for example, contains in it the *Idea* of a Power to prefer the doing, to the not doing any particular *Action*...so the *Idea* which the word *Will* stands for, is a complex and mixed one, made up of the simple *Ideas* of Power, and a certain Mode of thinking: and the *Idea* of *Liberty* is yet more complex, being made up of the *Idea* of a power to act, or not to act, in conformity to Volition. But I hope this transgression, against the method I have proposed to my self, will be forgiven me, if I have quitted it a little, to explain some *Ideas* of great importance...in this place, where they, as it were, offered themselves, and sprang up from their proper roots.”

⁶¹ To Molyneux, 20 January 1693. Locke 1976, volume 4, page 623.

force in the discussion of the will, and that there is a systematic program in the *Essay* (“the connection of the parts of my subject”) which focuses on an examination of our ideas.⁶²

If we understand 2.21 along the lines that I am proposing then it will bear an important structural similarity to many other chapters in Book II. One of Locke’s favorite strategies in Book II is to introduce some idea and then show how it is used to construct much more complicated ideas. By showing that these hugely complicated or abstract ideas are composed of simpler ideas Locke takes himself to be arguing for his empiricist claim that all of our ideas are compounded from simple ideas received in sensation and reflection. For example, 2.13 shows how our simple idea of space is used in the construction of our ideas of distance, capacity, immensity, figure, place, etc. 2.25 lays out the idea of relation and 2.26, 2.27, and 2.28 show how complex ideas like those of cause and effect, identity, and the like are elaborations on the idea of relation.

To hold that Locke was using his discussion of free will as a way of demonstrating the role played by the idea of power, as I am suggesting we do, is not to deny that Locke wanted to achieve other things with this discussion of free will. Locke does have an important positive program in 2.21.⁶³ And though it has been perhaps less recognized, Locke also has an important negative project in 2.21. The point to recognize, though, is that these two projects, that of showing how the idea of power is used to construct a variety of other ideas and that of identifying what the will is and how it works, are not in competition. There is nothing to prevent them from proceeding in tandem and even from complementing one

⁶² In this same letter, Locke professes admiration for those who read his *Essay* in the correct way and “observe the design and foundation of what I say, rather than stick barely in the words.” Locke 1976, volume 4, page 624.

⁶³ There is, of course, a voluminous literature on Locke on free will. See Yaffe 2000 for a treatment of this topic and discussion of much of the relevant literature.

another. So my conclusion is that Locke's discussion of free will and voluntary action proceeded in line with, and not apart from, a deep interest in the taxonomy of our ideas.

The second textual point is that Jacovides' proposal will struggle to explain the passages at 2.7. I think there will be no way to understand these discussions as about anything other than a simple idea of power. Thus, these passages will be impossible to reconcile with the idea that power is a mode, either simple or mixed. And so the scope of Locke's error will be even bigger than Jacovides' allows. The upshot of this is that even if we allow that Jacovides is right about the discussion at 2.21 and Locke does mean to be talking about simple modes, Jacovides will still have to acknowledge the central thesis of this chapter and admit that there is a simple idea of power as well as a simple mode of power.

Philosophically, I think it will be very hard to defend the notion that the only idea of power is a simple mode. Simple modes, for Locke, are constructed by concatenating together simple ideas. For example, the simple mode of number is constructed by concatenating together simple ideas of unity.⁶⁴ Jacovides' suggestion is that the simple mode of power could be constructed using simple ideas of action and change.⁶⁵ But Locke never mentions either of these as simple ideas. And I can find no textual support for the claim that Locke thought they might be simple ideas.⁶⁶

⁶⁴ See 2.16.

⁶⁵ See Jacovides 2003, pages 335 and 343.

⁶⁶ Furthermore, there are at least two passages in which Locke suggests that power is conceptually prior to action, and not *vice versa*. The first passage is from Locke's 1676 shorthand note on "Pleasure, Pain, the Passions": "...and to understand what the idea of power is and how we come by it, it will be convenient to consider action a little, *which is always a product of power*." Locke 1997, pages 243-244, emphasis added. The second is from 2.22.10: "It is worth our observing *which of all our simple Ideas have been most modified, and had most mixed Modes made out of them*...And those have been these three; Thinking, and Motion, ...and Power, from whence these Actions are conceived to flow." I think these passages suggest that the simple idea of power is an ingredient in all of our ideas of actions. See also 2.22.11.

It is also hard to understand how, if the idea of power is a simple mode, it could still be fundamentally dispositional in the way that Jacovides claims it is. If the idea of power is a simple mode it will just be an aggregation of simple ideas of action. But dispositions are fundamentally complex. They contain at least two components: the idea of the potential to do something and the idea of that potential being triggered or activated. But how, if the only tools one had were all identical, could one get the conceptual diversity contained in something like a disposition? It seems to me that one could not. One might respond by claiming that the conceptual complexity needed for dispositions is just contained in the ideas of action which make them up. But this would just be to resurrect the problem from the previous paragraph. If the simple idea of action contained this complexity then it would not be simple. And if the idea of power is not constructed out of generically identical simple ideas then it is not a simple mode.

Methodologically I believe we should be cautious about Jacovides' interpretation. Accusing a past philosopher of inconsistency or confusion is a very big move. Of course, I do not deny that past philosophers were ever inconsistent or confused. But, I do think that accusing one of inconsistency or confusion must be a last resort. The interpretive principle of charity demands that we only accuse a past philosopher of inconsistency or confusion after all other reasonable options have been exhausted.

And here there is a dialectical point to be made. If the arguments of this chapter are correct then it seems that there is an interpretation of Locke on the idea of power which avoids inconsistency or confusion. It saves Locke from making any serious taxonomical errors. And it saves Locke from having a confused understanding of simple ideas (indeed, much of the argument of the chapter was based on Locke's simple/complex distinction).

Given that this interpretation is available and rescues Locke from these mistakes it seems like much of the motivation for Jacovides' interpretation should dissipate.

7. Conclusion

The goal of this chapter has been to argue that Locke employs two distinct ideas of power in the *Essay*. The first is the simple idea of power, it is absolutely simple and is received in experience. The second is the complex idea of a specific power. This idea is complex, annexed to a particular substance, and targeted toward a particular sensible effect. I have argued for this distinction on the basis that it best makes sense of otherwise confusing textual irregularities in the *Essay* and that it better coheres with Locke's other commitments. I have also argued for this distinction on the basis that it helps Locke account of the idea of power avoid serious philosophical problems. Finally, I have argued that solving these problems by appealing to this distinction is preferable to other proposed solutions.

3. A New Approach to Lockean Relations

1. Introduction

The primary goal of this chapter is to identify and defend a new approach to Locke's claims about relations in the *Essay*. Previous interpreters have argued that Locke is offering an account of the metaphysics of relations. On my account, Locke is unconcerned with the metaphysics of relations. Instead, Locke is only attempting to examine the ways in which the mind compares the various ideas it has.

The chapter will proceed as follows. First, I will outline and defend my interpretation of Locke on relations. Following this I will examine two recent interpretations of Locke on relations which assume that Locke is arguing for a metaphysics of relations. I will provide a negative argument to show that this is not Locke's purpose. Following this I will consider two objections to my account. Finally, before concluding, I will examine two implications that my interpretation has. The first relates to Locke's account of causation and the second relates to debates surrounding superaddition.

I have found it helpful to introduce a terminological distinction in this chapter. I have used the word "relation-idea" to refer to ideas of relations. These, I argue, are the products of a mental comparison of ideas. I have used the word "relation" to refer to metaphysical

relations. These are states-of-affairs in the external world. So, it is my view that Locke is interested in exploring and explaining relation-ideas but has no firm views about the ontological nature of relations.¹ Although Locke sometimes distinguishes between “relation” and “idea of relation” he also often uses the former to refer to the latter. I have tried to be strict in my terminology, and I hope the slightly unnatural language serves to clarify rather than obscure the arguments of this chapter.

2. Relation-Ideas as Mental Comparisons

Locke’s initial introduction of relation-ideas occurs in 2.12 where he begins his discussion of complex ideas. Locke there divides complex ideas into three categories: ideas of modes, ideas of substances, and ideas of relations (or relation-ideas). Here is what he has to say on the topic: “The Acts of the Mind wherein it exerts its Power over its simple *Ideas* are chiefly these three . . . 2. The 2d. is bringing two *Ideas*, whether simple or complex, together; and setting them by one another, so as to take a view of them at once, without uniting them into one; by which way it gets all its *Ideas* of Relations.”² Later in the chapter he offers a slightly longer treatment: “Thirdly, The last sort of complex *Ideas*, is that we call *Relation*, which consists in the consideration and comparing one *Idea* with another....” So already we can establish a few things about our relation-ideas. They are complex ideas. And Locke clearly thinks that they are formed following some *action of the mind*; the mind plays

¹ As will become clear later, Locke does believe that objects in the external world are related to one another. So he does have a very minimal ontic commitment to the existence of relations. My claim is just that Locke has nothing further to say on this point. Put differently, Locke does not have any views on what sorts of metaphysical entities are required for a relation to obtain between two objects.

² 2.12.1.

an important role in actively constructing our relation-ideas. The section head of 2.12.2 emphasizes that the ideas under consideration are “Made voluntarily.”

Even at this early stage we can note an important omission in Locke’s description of relation-ideas. Contrast what Locke says about relation-ideas with the account of ideas of substances that he gives in the same introductory chapter. Locke writes that “The *Ideas* of *Substances* are such combinations of simple *Ideas*, as are taken to represent distinct particular things subsisting by themselves; in which the supposed, or confused *Idea* of Substance, Is always the first and chief.” This differs significantly from Locke’s initial presentation of our relation-ideas. While ideas of substances are taken to represent things subsisting by themselves, relation-ideas are not “taken” to be (subsist as) or represent (stand in place of) anything at all. So already in Locke’s initial presentation of our relation-ideas we see that there is an emphasis on the actions of the mind in its examinations of its ideas and a lack of attention to the ontic structure of external world relations.

After introducing relation-ideas in 2.12 Locke moves on to discuss our various ideas of substances and modes before returning to relation-ideas and offering a full account in 2.25-2.28. 2.25 opens by suggesting that the mind, in its consideration of any idea, is not bound to consider that idea in solitude. The mind can, in considering any of its ideas, “see how it stands in conformity to any other.”³ A critical component of our relation-ideas, therefore, is the inclusion of two distinct ideas. Locke illustrates this with a simple example. When I think of Caius as a white man there is no relation-idea; the idea of a white color is a proper part of my complex idea of Caius. But when I think of Caius as whiter there must also be the idea of some object which is less white than Caius; the mind compares Caius and

³ 2.25.1.

the other idea to form a relation-idea. As Locke puts it “I intimate some other thing...my Thought is led to something beyond *Cajus*.”⁴

2.25 continues on to discuss many other features of our relation-ideas. 2.25.2 makes the point that some English words (father, wife) are obviously relational where as others (concubine), though relational, are less obviously so. 2.25.5 discusses mere Cambridge changes and the way in which an idea can remain fixed and undergo no intrinsic changes yet can still undergo changes in the relation-ideas the mind places it in. 2.25.7 discusses the myriad relation-ideas that a single idea can be involved in and the enormous role that relation-ideas play in our everyday thought and language. In the conclusion of the chapter Locke announces that he has given a general theory of our relation-ideas and that in the coming chapters he will consider some specific instances of our relational thinking. His goal in doing so will be to show that all of our relational thinking is the product of the mind’s comparative activities.⁵

Locke makes good on this promise in the next three chapters. 2.26 discusses causal, spatial, and temporal relation-ideas. 2.27, famously, discusses various relation-ideas of identity. And 2.28 discusses varieties of moral relation-ideas. In these chapters Locke attempts to show that there are vast portions of human thought which cannot be accounted for by the mind’s consideration of single ideas in isolation. We can conclude that much of our thought includes the mind considering multiple ideas not as combined into a single complex idea, but as differing or agreeing in interesting ways. Our causal thinking involves

⁴ 2.25.1.

⁵ Locke foreshadows this theme of 2.25.11 (whose subject heading is ‘Conclusion’) in 2.25.9 (whose subject heading is “Relations all terminate in simple Ideas”). Indeed the two sections are so strikingly similar that it is curious Locke saw fit to include both and saw fit to insert 2.25.10 (‘Terms leading the Mind beyond the Subject denominated, are Relative’) in between them.

comparing our ideas of the actions of one object with our ideas of the actions of another. For example, we might compare our idea of the motion of a brick with our idea of the shattering of a window. Our thinking about identity involves comparing our idea of an object existing at t1 with our idea of an object existing at t2.⁶ And our moral thinking involves comparing our ideas of individual actions with our ideas of abstract laws or rules.⁷

Examining the language Locke uses when working his way through these topics helps to show that his concern is with ideas and the mind's operations on them. Specifically, Locke's language shows that he is interested in the mind's acts of comparing. This is evident when Locke writes that "*Relation* is a way of comparing, or considering, two things together..."⁸ or that "Though there be a great number of Considerations, wherein Things may be compared one with another, and so a multitude of *Relations*..."⁹ In his first letter to Stillingfleet Locke writes the following: "For I never denied, that the mind could frame to itself ideas of relation, but have showed the quite contrary in my chapters about relation."¹⁰ This suggests that the mental act of "framing" relation-ideas takes center stage in the relevant chapters. At one point, Locke even goes so far as to say that the *nature* of relation-ideas depends on these acts of the mind: "The nature therefore of Relation, consists in the

⁶ Here is Locke's introduction to that chapter: "ANOTHER occasion, the mind often takes of comparing, is the very Being of things, when considering any thing as existing at any determin'd time and place, we compare it with it self existing at another time, and thereon form the *Ideas of Identity and Diversity*." 2.27.1 Note his emphasis on the mind's comparative action.

⁷ Of course, these mental acts might lead an agent to make metaphysical judgments. For example, she might conclude that the brick shattered the window. And so the agent might come to believe that some relations exist, like the one between the brick and the window. But she will not have any further beliefs about the ontological character of these relations.

⁸ 2.25.7.

⁹ 2.25.9.

¹⁰ *Letter to Stillingfleet*. Locke 1823, volume 4, page 21.

referring, or comparing two things, one to another, from which comparison, one or both comes to be denominated.”¹¹ This language promotes the interpretation of Locke on which he is interested in relation-ideas, not in relations. Rather than investigate the metaphysical nature of the links between objects in the external world, Locke is investigating the mind’s comparison of its ideas to each other.

The things which Locke takes as explananda for his account of relations also support the claim that he is offering a psychological account of our relational thinking. Many of Locke’s remarks indicate that he wants his account of relation-ideas to adequately capture the sorts of relational thinking that people actually engage in. Rather than describe the objective facts surrounding the metaphysics of relations Locke seeks to account for the relational claims and judgments of ordinary people. In doing this, Locke starts with the ideas that people have, rather than with the assumed facts about the external world. For example, Locke discusses the sense in which “old” is a relational concept. In the course of this discussion he points out that we never refer to objects like stars and planets as old.¹² This is because when we call something old “[we] have in our Minds, as it were, as Standard, to which we can compare the several parts of their Duration; and by the relation they bear thereunto, call them Young, or Old, which we cannot therefore do to a Ruby, or a Diamond, things whose usual periods we know not.”¹³ Of course, there may be some fact of the matter about how long things like diamonds and planets last. But Locke is interested in why we make the age judgments that we do, not in what the correct judgments might be. Similarly,

¹¹ 2.25.5.

¹² This has obviously changed. Now astronomers do talk about the age of planets, stars, etc.

¹³ 2.26.4.

Locke is keen to show how and why different minds might differ in their comparisons: “And that will be a great Horse to a *Welsh*-man, which is but a little one to a *Fleming*; they two having from the different Breed of their Countries, taken several siz’d *Ideas* to which they compare, and in relation to which they denominate their Great, and their Little.”¹⁴ Locke’s claim is that different peoples’ minds will produce very different relation-ideas depending on the stock of ideas their minds are furnished with.

The vast scope that Locke takes his discussion of relation-ideas to have also provides support for the thought that he was interested in a psychological approach to relational thinking, rather than a metaphysical approach to relations. In the relevant chapters Locke presents a unified theory which he takes to have significant explanatory force. While he discusses many applications of his general view on relation-ideas he notes that he could have gone into greater detail: “’Twould make a Volume, to go over all sorts of *Relations*: ‘tis not therefore to be expected, that I should here mention them all. It suffices to our present purpose, to shew by these, what the *Ideas* are, we have of this comprehensive Consideration, call’d *Relation*. Which is so *various*, and the Occasions of it so *many*, (as many as there can be of comparing things one to another)...”¹⁵ Here is a partial list of the kinds of relation-ideas Locke takes his single theory to encompass:

- 1) Basic physical relation-ideas: is bigger than, is soluble in, is gravitationally attracted to
- 2) Social relation-ideas: is married to, is the father of, is the subject of
- 3) Identity relation-ideas: is the same person as, is different from
- 4) Moral relation-ideas: is more virtuous than, is illegal, is punishable by
- 5) Mathematical relation-ideas: is greater than, sums to, is divisible by

¹⁴ 2.26.5. See also 2.13.8.

¹⁵ 2.28.17.

When we consider the different sorts of ideas which Locke thinks the mind compares to form relation-ideas the scope becomes even broader. Locke seeks to account for relation-ideas that include our ideas of ordinary objects, imaginary objects, ideas, supernatural entities, individual actions, and abstract rules. And with respect to personal identity, Locke is clear that we are comparing our ideas of persons, but he seems unwilling to even speculate about the metaphysical constitution of personhood.¹⁶

If Locke was interested in offering an account of the metaphysics of relations it would be rather odd if he thought he could offer one unified account for such a mixed bag of cases. If he was interested in the metaphysical details of relations he would almost certainly would have helped himself to some familiar distinctions (for example, real relations vs. relations of reason, or internal vs. external relations) in order to cope with such diversity. But no such distinctions appear in the relevant chapters. Locke *does* seem to be offering a unified account of relation-ideas. He seems to treat each type of relation-idea the same. And he makes clear that he understands 2.26-2.28 as a straightforward application of the general picture put forward in 2.25. If we allow that Locke was interested in offering a psychology of relational thinking then this makes good sense. Whatever the status of the entities being related and whatever the metaphysics undergirding the relation, it is plausible to say that it is the same mental operation that is responsible for making the comparison between the ideas of the relevant entities. So if we allow that Locke is interested in a psychology of relation-ideas we can make sense of the scope he takes his account to have. And we will struggle to make sense of this scope if we persist in thinking he is offering a metaphysical account of relations.

3. An Initial Objection

¹⁶ This theme runs throughout 2.27. See Waldow 2012 for further discussion.

Here an initial objection to the account of Lockean relation-ideas I am developing might present itself. If all that a relation-idea consists in is the mind's comparison of two ideas then the account will be too weak. Consider a baseball and a bowling ball. Merely allowing that the mind compares ideas of these two objects does not seem to be sufficient to account for our understanding of the relations that hold between them. There are at least two different relations that hold between a baseball and a bowling ball; the bowling ball is *larger than* the baseball and the bowling ball is *heavier than* the baseball.

We can overcome this objection by developing a notion of comparison *with respect to*. Recall that for Locke our ideas are fundamentally compositional. Ideas of complex objects like roses are combinations or compositions of simple ideas like red, prickly, sweet-smelling, etc. The same will be true of the ideas of the bowling ball and the baseball. Each one will be constructed out of many simple ideas. Amongst these simple ideas will be idea of their size, their shape, their weight, their colors, their use, their powers, etc. My claim is that Lockean ideas can be considered with respect to one of their constitutive ideas.

Phenomenologically this thought is simple enough; it is intuitively obvious that we can consider a basketball either as an orange thing (with respect to its color) or as a round thing (with respect to its shape). But there is a question of how this will work within the context of Lockean ideas. In Locke's initial introduction of relation-ideas he uses spatial metaphors to describe the mind's actions. He writes that the mind "brings together" two ideas and "sets them by one another" to get its relation-ideas. I propose that we embrace this spatial metaphor in developing an account of "considering with respect to." When voluntarily bringing two physical objects together and placing them alongside one another one is faced with a series of decisions relating to their final arrangement. Depending on the

exact positioning of the two objects different features will be emphasized. Just so, I want to argue, with Lockean ideas. I think we can imagine ideas as being capable of being set beside one another in very different configurations. And these different configurations are what determine the precise comparison which the mind makes. The physical space in this metaphor stands in for logical proximity or salience.

There is textual support for the claim that Locke thought ideas could not only be compared, but could be compared with respect to some of their constituent ideas. Consider the following passage: “The *COMPARING* them [ideas] one with another, **in respect of** Extent, Degrees, Time, Place, or any other Circumstances, is another operation of the Mind about its *Ideas*, and is that upon which depends all that large tribe of *Ideas*, comprehended under *Relation*...”¹⁷ This quote shows two important things. First, it reiterates the, by now familiar, point that Locke understood relation-ideas to be generated through a comparative act of the mind. Second, it shows that Locke understood that ideas could be compared *with respect to* their constitutive features.

Once we acknowledge the compositionality of Lockean ideas we can understand how Locke’s account of our relation-ideas can capture the difference between distinct relations had by the same objects. When the mind thinks of the bowling ball as bigger than the baseball it is comparing the two complex ideas with respect to its ideas of their size. It is the ideas of size which are the direct subject of comparison, the other constitutive ideas of the complex ideas of the baseball and bowling ball are, as it were, just along for the ride. When the mind thinks of the bowling ball as heavier than the baseball it is comparing the two complex ideas with respect to its ideas of their weight. The ideas of weight ground the

¹⁷ 2.9.4. Emphasis added.

comparison and it is because the ideas of weight help comprise their respective ideas of a substance that the bowling ball is said to be heavier than the baseball.

One might try to press this objection one step further. One might claim that merely comparing the two ideas with respect to one of their constitutive ideas will still be too weak. It will not be able to account for all the relations that hold between objects. The bowling ball is *larger than* the baseball but the baseball is also *smaller than* the bowling ball. According to the objector, Locke's account of relation-ideas will be unable to distinguish between these two relations. All a Lockean agent can do is compare the ideas of the two objects with respect to their constitutive ideas of size. But in doing so, the objector continues, she will miss the distinction between these two relations.

Locke would be extremely unimpressed with this sort of objection. The central message of Book 3 of the *Essay* is that words are posterior to ideas. Locke's claim would be that there is no substantive distinction to be made between the baseball's being smaller than the bowling ball and the bowling ball's being larger than the baseball. For Locke, words only refer to ideas. And Locke is perfectly comfortable with the possibility that different words can refer to one and the same idea. So Locke's claim would just be that his account does have sufficient explanatory power because it is unnecessary to explain the difference between the bowling ball's being larger than the baseball and the baseball being smaller than the bowling ball. An agent who at one moment claims "the bowling ball is larger than the baseball" and at the next claims "the baseball is smaller than the bowling ball" will usually have the very same (or extremely similar) ideas in her mind at both moments.

4. A Metaphysics of Relations?

In the previous few sections I have sketched out an account of how Locke understood our relation-ideas. I have suggested that Locke understood relation-ideas as ways in which the mind compared various ideas it has. I believe that this examination of the mind's comparative actions was the reason Locke discussed relations and relation-ideas. Understood this way, Locke's account of relation-ideas is part of his larger project in the *Essay* of accounting for the human mind's scope and powers. This task of exploring the contents and functions of the human mind differs greatly from an investigation of the metaphysics underpinning external world relations. The fact that Locke's account of our ideas of relation-ideas does not appeal to anything other than ideas in the mind and the mind's actions upon them has led me to believe that Locke was simply uninterested in the metaphysics of relations.

So I have been willing to move from the premise that Locke's explicit account of relation-ideas says little or nothing about the metaphysical status of relations to the conclusion that Locke was simply uninterested in offering a metaphysical account of relations. But we are not forced into this conclusion. One might claim that even if Locke in his explicit discussions of relation-ideas (2.12, 2.25-2.28) does not offer a metaphysics of relations there is still a metaphysics of relations to be had in the text of the *Essay*. According to this approach, we will be able to glean from elsewhere in Locke's writings his position on the metaphysics of relations. Locke may have had a position on the metaphysical status of relations which he chose to deploy outside of the chapters where he discusses our relation-ideas.

Up until this point I have said nothing which might dissuade us from this sort of approach to Lockean relations. And certainly a number of commentators have seemed to

think that Locke has something substantial to say on the ontology of relations.¹⁸ Readers of Locke have wondered whether relations are mind-dependent or mind-independent, whether relations arise naturally or are created by God in a special act, and, more recently, they have wondered whether Lockean relations are or include metaphysical entities distinct from the two objects related or whether the relations can be accounted for by just the two relata.¹⁹

In this section I will consider works by Rae Langton and Walter Ott which argue that Locke was offering a metaphysics of relations.²⁰ I have chosen to focus on these two works for three reasons. The first is that they offer some of the most-developed approaches to Lockean relations. The second is that they form the locus of the most recent debate on Lockean relations. And the third, and perhaps most important, is that they can serve as concrete representatives of the more general metaphysical approach which I discussed in the previous paragraph and which I want to argue against in this section.

Ott defends a *reductionist* account of Lockean relations. His central claim is that Lockean relations “are reducible to the non-relational qualities of their relata.”²¹ So on this view there is metaphysically nothing more to a relation than the objects related. According to Ott, it is still permissible to speak of relations which hold between objects, the important point is just that in doing so one does not ontologically commit to anything existing over and above the objects which are related.

¹⁸ I mean here to contrast “substantial” claims about the ontology of relations with the relatively insubstantial claim that certain relations obtain.

¹⁹ Of course, these three questions are not independent of one another and many accounts of Lockean relations provide an answer to all three.

²⁰ Langton 2000 and Ott 2009, chapter 19.

²¹ Ott 2009, page 159.

Consider an example. You see a golf ball and a baseball. It is natural to say that there is a relation of size which holds between them. The baseball is bigger than the golf ball; the golf ball is smaller than the baseball. But there is a further question about what it takes for this metaphysical relation to obtain; what is it for this relation to hold. On Ott's reductionist view all that is necessary for the relation to hold is the existence of the non-relational properties of the baseball and the non-relational properties of the golf ball.

By contrast, Langton defends a *non-reductionist* account on Lockean relations. Her position is that the non-relational properties of objects are insufficient to account for all of the relations that hold between them. On this view, some relations must involve something metaphysically over and above the objects related. So it is the case that sometimes when one claims two objects are related one is ontologically committed to the existence of a thing distinct from the two relata.

Both the reductionist and non-reductionist accounts face specific difficulties. The reductionist faces the challenge of making precise what is meant by a non-relational quality. Using the term non-relational to develop the position is circular. Two obvious replacement candidates are intrinsic properties and primary qualities. But both of these bring along serious philosophical and textual difficulties.²² I think the non-reductionist will also struggle to precisely formulate her account. It is quite easy to maintain that some relations require an entity which is distinct from the relata, but it is much more difficult to say precisely what that entity is. What is it, over and above the relata, that is necessary for the relation to obtain? There are a number of candidates. One could insist that there are reified relations

²² For one, Locke thinks that objects have absolutely no essential properties until they are classified under a nominal essence. See 3.6.4.

(independently existing objects which “grab” or “link together” the relata),²³ one could appeal to irreducible relational properties,²⁴ to laws of nature, to divine volitions (either general or particular),²⁵ or to something else entirely. Alternatively, one might insist that the mechanism which God has used to realize these relations is miraculous and utterly mysterious to human observers, but that there nonetheless is some extra entity. Again, I think that all of these possibilities face serious textual and philosophical difficulties. So both positions leave some questions open.

I wish, however, to ignore problems specific to either account. My goal instead is to look at the underlying project of both positions.²⁶ Both Ott and Langton are agreed that Locke was interested in a particular view on the metaphysics of relations and that this view can be straightforwardly extracted from the text. And this point of agreement between them is the point that I wish to contest. So rather than focus on problems which are particular to their accounts I want to consider the broader project they are engaged in and attempt to show where I think it goes wrong. My goal will be to show that Locke holds that our thinking about relations floats free of the metaphysics of relations in the external world.²⁷ I will aim to show that the account of relation-ideas which Locke gives in the *Essay* (which I take to be an account of our relational thinking) is compatible with many different views about the

²³ This seems to be Ott’s reconstruction of Langton’s non-reductionist position. See Ott 2009, page 161.

²⁴ Note that these irreducible relational properties would not necessarily have to be either intrinsic or essential properties. Of course, this would make them strange entities, but that strangeness would not prevent them from fulfilling their function.

²⁵ Langton invokes these last two in her reading. She argues that there are divine volitions which stand as laws of nature and put various objects into relations. See Langton 2000, pages 89-91.

²⁶ This is in keeping with my general strategy of using Ott and Langton as mere examples of a broader strand of interpretation.

²⁷ Note, however, that I am *not* committed to the stronger claim that Locke thinks our thinking about relations floats free of relations in the external world.

ontological status of relations and that it is neutral with respect to all of these views. Put differently, I will argue that Locke did not intend to commit himself to a position on the ontological status of relations.

One good place to start when wondering whether Locke may have been offering a metaphysical account of relations is to see what Locke says about the connection between our relation-ideas and relations in the world. Presumably, if one thinks that Locke has a position on the reducibility or non-reducibility of relations then he arrived at this conclusion by reflecting on his relation-ideas. This is because Locke holds that all of our knowledge has to do with ideas and that wherever we lack ideas we lack knowledge. Put differently, if Locke holds that relations are reducible, or if he holds that they are non-reducible, then this should be reflected in what he says about our relation-ideas.

When one looks for a connection between relations in the world and our relation-ideas, however, we simply do not find anything that could tell us about the ontological status of relations. Locke writes that:

complex ideas of modes and relations are originals, and archetypes; are not copies, nor made after the pattern or any real existence, to which the mind intends them to be conformable, and exactly to answer. These being such collections of simple ideas that the mind itself puts together, and such collections that each of them contains in it precisely all that the mind intends that it should...²⁸

This passage is important insofar as it severs the connections between relation-ideas and the metaphysics of relations in two distinct ways. First, relation-ideas do not mirror relations, they “are not copies” of things in the world. Thus, we will not be able to work backwards by

²⁸ 2.31.14.

examining our relation idea to learn about its cause, a metaphysical relation in the world.²⁹

Second, in the act of constructing our relation-ideas Locke does not think that we intend for them to correspond to relations in the world (“nor made after the pattern of any real existence, to which the mind intends them to be conformable.”) Our relation-ideas are not made with the aim of representing or resembling things in the world or with the aim of representing any features of the world. This deprives us of another opportunity to learn about relations by examining our relation-ideas.

This second theme is reiterated in Locke’s chapter “Of Real and Fantastical *Ideas*.” Real ideas “have a Conformity with the real Being, and Existence of Things, or with their Archetypes” whereas fantastical ideas “have no Foundation in Nature, nor have any Conformity with that reality of Being.”³⁰ According to Locke, relation-ideas are real ideas, but not because they track some external reality or are made to conform to real structures in the world. Instead, they are real just because they only purport to tell us something about our minds and the psychological processes of comparison our minds undertake: “*Mixed Modes and Relations*, have no other *reality*, but what they have in the Minds of Men, there is nothing more required to those kind of *Ideas*, to make them *real*, but that they be so framed, that there be a possibility of existing conformable to them.”³¹ So the project of learning about the metaphysics of relations by examining our relation-ideas seems a difficult one.

²⁹ It is worth noting that *even if* we allow that our relation-ideas are caused by relations, working backwards from the idea to learn about the cause will be extremely difficult or impossible. This is especially true given that Locke thinks that ideas can have positive causes but also can be caused by privations. See 2.8.1-7. So even if my relation-idea included ideas of things distinct from the relata this would not guarantee that the relation in the world was distinct from the relata. The positive idea could have a privative cause.

³⁰ 2.30.1.

³¹ 2.30.4.

Consider the connections between pictures of Mt. Everest and Mt. Everest. One way a picture could inform us about Mt. Everest is by having many features of its existence be directly copied from Mt. Everest. This is the way a photograph may represent Mt. Everest. Because Mt. Everest was a cause of the photo and the camera was designed to faithfully reproduce certain features of its subject, the photo might help us reach some conclusions about Mt. Everest. Next consider an oil painting by someone who had never seen Mt. Everest or a photograph of Mt. Everest. Nevertheless, assume that our painter was nevertheless intending her painting to represent Mt. Everest and thus incorporated various of her beliefs about Mt. Everest (that it is taller than surrounding mountains, that it is covered in snow, that it has a prominent geological formation halfway up its eastern side, etc.) or about mountains more generally (that they are made of rocks, that their sides tends not to be perpendicular to the horizon, that they tend to be taller than one-story buildings, etc.). Given that the artist intended her painting to represent Mt. Everest we can likely learn something about Mt. Everest from her painting.³² But now imagine that someone drew a picture of Mt. Everest without ever having seen Mt. Everest or any depiction of Mt. Everest. Assume as well that this person was aware that there was a physical Mt. Everest in the world, but that she was uninterested in having her picture represent or resemble Mt. Everest (she was unconcerned with how tall it was compared to other mountains, with whether there was snow on it, with whether or not there was a McDonald's restaurant on the summit, with whether or not it bore a striking resemblance to a Mercedes convertible, etc.) Presumably, in this sort of case, we would have no basis for making inferences about the nature of Mt. Everest on the

³² Of course, the painting will likely be less informative than the photograph, but that need not concern us here.

basis of this picture. In fact, it would be hard to understand the sense in which her picture of Mt. Everest was *of* Mt. Everest.

Given that our relation-ideas are like this third depiction of Mt. Everest it would be rather odd to think that we could learn very much about relations in the world from our relation-ideas. Specifically, it would be very odd to think that we could discover whether relations were independent features of the universe, whether they reduce to objects, or whether they reduce to anything at all. Thinking that we could learn such things from our relation-ideas is akin to thinking that we could learn the geological composition or exact location of Mt. Everest from the third picture.

I take the above considerations to be especially problematic for the non-reductionist about Lockean relations. It seems hard to maintain that relations are a reified component of the universe or that they include a metaphysical component apart from the relata given that Locke says relation-ideas do not represent relations existing in the world and does not mention any other things (laws, for example) in his account of relation-ideas. So Langton's position is under significant pressure. Ott, on the other hand, may have a response to the line of argument above.

Perhaps Ott could argue that Locke's assertion that relation-ideas do not and are not intended to represent relations is just more evidence for his view. After all, his view is that relations are not real things distinct from relata, they are just a way of describing the features that bodies have. And Ott can still claim that there is something in the objects which makes them *appropriate* subjects for a relation-idea. On this way of looking at things, we might get some evidence for Ott's position because while Locke argues that relation-ideas do not represent independently existing objects, he does think that they are somehow grounded in

the (supposed) real existence of their relata. The reductionist could even point to a passage in which Locke says that “There must always be in relation two Ideas, or Things, either in themselves really separate, or considered as distinct, *and then a ground or occasion for their comparison.*”³³ Thus, Ott might argue, relations are not really existing things but instead reduce to non-relational features of objects, specifically, the non-relational features which are the “ground or occasion” for the relation-idea.³⁴

I think that this strategy is problematic on two counts. The first is that even if we allow that it avoids problems raised by Locke’s claims that relation-ideas do not resemble anything in the world we should not allow that it provides positive evidence for Ott’s view. It is still possible that something more than the relata is necessary for bringing about certain relations. It might just be the case that these extra objects do not cause ideas in our minds in the straightforward way that the relata do. We may have to learn about these extra entities by examining the objects which they relate. So Langton can respond by claiming that the way I come to know about the robust non-reductionist metaphysics undergirding the height-relation that holds between Smith and Jones is by noticing their different heights.³⁵

A second, more serious, problem with this strategy is that Locke makes it very clear that the grounding of our relation-ideas is in our ideas and not in objects: “Any Idea, whether simple, or complex, may be the occasion, why the Mind thus brings two things together, and

³³ 2.25.6. Emphasis added.

³⁴ This is what Ott calls his “foundational conceptualism”, see Ott 2009, page 167.

³⁵ It may sound un-Lockean to think that we can learn about metaphysical entities which we have no immediate ideas of, but there are some parallel cases in the *Essay*. Locke suggests we can learn about several species of angels by noticing the vast array of different corporeal species. He claims we can learn about God by examining our ideas of ourselves as thinking things. And he strongly hints that we can learn about unobservable corpuscles by examining our ideas of regular bodies. See, respectively, 3.6.12, 4.10, and 2.8.18-21.

as it were, takes a view of them at once, though still considered as distinct: therefore any of our Ideas, may be the foundation of Relation.”³⁶ Or, more conclusively: “all relation terminates in, and is ultimately founded on those simple ideas, we have got from Sensation, or Reflection.”³⁷ More importantly though, Locke thinks that any of our ideas can serve as the ground of a relation-idea no matter how inadequate, false, or gerrymandered it is. Put differently, ideas which ground relation-ideas do not have to conform to non-relational features of really existing external world objects. Consider the following passage: “For if I believed, that Sempronius digged Titus out of the Parsley-Bed, (as they use to tell Children,) and thereby became his Mother; and that afterwards in the same manner, she digged Caius out of the Parsley-Bed, I had as clear a Notion of the Relation of Brothers between them, as if I had all the Skill of a Midwife...”³⁸ It is not true, on Ott’s account, that being dug out of the same parsley-bed by the same woman is what makes Titus and Caius appropriately related as brothers. Nevertheless, Locke claims that this feature of our idea of Titus and our idea of Caius furnishes us with the correct, or an adequate, understanding of the fraternal relation between them.

³⁶ 2.25.1.

³⁷ 2.28.18. The passage continues: “For when a Man says, Honey is sweeter than Wax, it is plain, that his Thoughts in this Relation, terminate in this simple Idea, Sweetness, which is equally true of all the rest, though, where they are compounded, or decompounded, the simple Ideas, they are made up of, are perhaps, seldom taken notice of: v.g. when the Word Father is mentioned: First, there is meant that particular Species, or collective Idea, signified by the word Man; Secondly, Those sensible simple Ideas, signified by the word Generation; and Thirdly, The Effects of it, and all the simple Ideas, signified by the Word Child.” See also 2.25.9: “so a multitude of Relations: yet they all terminate in, and are concerned about those simple Ideas, either of Sensation or Reflection.”

³⁸ 2.28.19. The passage continues: “the Notion that the same Woman contributed, as Mother, equally to their Births, (though I were ignorant or mistaken in the manner of it,) being that one which I grounded the Relation; and that they agreed in that Circumstance of Birth, let it be what it will. The comparing them then in their descent from the same Person, without knowing the particular Circumstances of that descent, is enough to found my Notion of their having, or not having the Relation of Brothers.” See also 2.28.20 where Locke says one can determine whether a given object is longer or shorter than a (supposed) yard regardless of whether the yardstick being used is accurate or not.

There are two other places in the *Essay* where Locke makes a similar point. Because the point is an important one they both deserve quotation:

This farther may be observed, That the *Ideas* of Relation, may be the same in Men, who have far different *Ideas* of the Things that are relatd, or that are thus compared. v.g. Those who have far different *Ideas* of *Man*, may yet agree in the notion of a *Father*: which is a notion superinduced to the Substance, or Man, and refers only to an act of that thing called Man; whereby he contributed to the Generation of one of his own kind, let Man be what it will.³⁹

For significant relative Words, as well as others, standing only for *Ideas*; and those being all either simple, or made up of simple ones, it suffices for the knowing the precise *Idea* the relative term stands for, to have a clear conception of that, which is the foundation of the Relation; which may be done without having a perfect and clear *Idea* of the thing it is attributed to. Thus having the Notion, that one laid the Egg, out of which the other was hatched, I have a clear *Idea* of the Relation of *Dam* and *Chick*, between the two Cassiowaries in St. *James*'s Park; though, perhaps, I have but a very obscure and imperfect *Idea* of those Birds themselves.⁴⁰

I think the message in both of these passages is the same. The facts about our relational thinking hinge on features of our ideas, not on features of objects in the world and certainly not on the metaphysics undergirding relations. And if the substantial metaphysics underlying relations plays no discernible role in our relational thought, it is hard to see how we could ever come to know about it.

5. Two Objections

I now want to consider two objections to the new approach to Lockean relation-ideas and Lockean relations which I am proposing in this chapter. The first objection holds that

³⁹ 2.25.4.

⁴⁰ 2.25.8.

although I have claimed that Locke's discussion of relation-ideas is neutral between various different metaphysical theories of relations there is, in fact, a tacit metaphysical position in my view. The second objection holds that my account is difficult to square with a number of texts.

5.1 Conceptualism

One objection to the view I have argued for in this chapter is that it makes Locke into a conceptualist about relations. The conceptualist view holds that what makes a relation is a mind's act of relating two things.⁴¹ If this were my view then it would be untenable. For example, in a world where a basketball and a baseball are the only two objects it will not be the case that the basketball is bigger than the baseball because there are no minds to provide the correct concepts and to relate the two items. This example seems to serve as a straightforward *reductio* of the conceptualist position.⁴²

An objector would be mistaken in thinking that my view is the conceptualist one sketched above. But the objector's mistake can be a helpful one insofar as it serves to further clarify my view. On my view, to argue that Locke is a conceptualist is just to make the same mistake as those who claim that Locke is a reductionist or a non-reductionist. Specifically, to claim that Locke is a conceptualist is to commit him to a view about the ontological status of relations among external things. And my position is that Locke intends his discussion of

⁴¹ I know of only one interpreter who has claimed that Locke is a conceptualist about relations. Block 1971, page 22 has it that "for Locke a relation is a mental creation projected or superimposed upon reality." Block admits that this conclusion is "startling" (page 23) and faces some obvious shortcomings.

⁴² One might suggest that the conceptualist could adapt by formulating a counter-factual theory of conceptualist relations. In this case we might say that the basketball is bigger than the baseball just because they are fitly disposed to be related by a human mind, were there any human minds present. Whatever the merits or demerits of this as a philosophical position, I think it will not work as a reading of Locke. I admit that there are some passages which may lend themselves to an interpretation of Locke as a conceptualist. I believe there are none which lend themselves to an interpretation of Locke as a counter-factual conceptualist.

relation-ideas to do no such thing and that his discussion of relation-ideas is neutral with respect to their ontological status.

There is, however, an important connection between my position and conceptualism. And this connection serves to explain why one view might be mistaken for the other. Both the conceptualist and I agree that the focus of Locke's theory is on the mind and the ways in which it compares things. The difference is that the conceptualist thinks that the mind compares objects in the world and thereby creates relations whereas I hold that the mind compares ideas but that this proceeds independently of whatever relations might actually hold in the world.

I mentioned above that the conceptualist position might be seen as a non-starter. The example of the world with just the baseball and the basketball was meant to show the intrinsic weaknesses of the conceptualist view.⁴³ But the conceptualist might respond that this example does no more than beg the question against her view. So before moving on, I think it is important to highlight some textual difficulties which make a certain form of conceptualism an untenable interpretation of Locke on relations.

The problem, simply put, is that there are a number of places in the *Essay* where Locke allows that there are relations which the mind takes no notice of. Indeed, Locke even seems to think that there are relations among our ideas which we may have missed.

Locke does seem to allow that there are relations in the external world. And he allows that these relations exist independently of human thought. At 1.4.22 Locke claims there are mathematical relations which hold despite being unknown to vast numbers of

⁴³ Ott has attacked the conceptualist view on just this point. Ott 2009, pages 164-165.

people.⁴⁴ At 4.6.11 Locke claims that we very often overlook the connections (relations) between bodies: animals require air, human beings require the sun, etc. So these are relations that exist unobserved by any human agent. Or consider the following passage: “For ‘tis certain, that in reality, the Relation is the same, betwixt the Begetter, and the Begotten, in the several Races of other Animals, as well as Men: Bet yet ‘tis seldom said, This Bull is the Grandfather of such a Calf; or that two Pidgeons are Cousin-Germains.”⁴⁵ Here Locke suggests that there are real relations of descent that hold between cows and pigeons. And he further suggests that these relations hold even though they always or almost always go unnoticed or unrecognized by humans.

I certainly do not want to deny that Locke thought that there were relations in the external world. On its own, without any supplementary theses about the ontological status of those relations, this is a quite minimal commitment. Further, I certainly do not want to deny that Locke thought we learned about these relations via our ideas of objects in the external world. When Smith asks Jones where the newspaper is and she replies that the newspaper is on top of the table Smith and Jones seek to convey information about a spatial relation that actually obtains between two objects which they take to exist in the external world. Any interpretation that has Locke denying this seems implausible. In pushing for a psychological approach to Lockean relation-ideas, and by extension to Lockean relations, I do not mean to deny that Locke thought there were relations in the external world or that we often seek to know about and manipulate these relations. What I do deny is that Locke intended to offer a

⁴⁴ He puts the point even more bluntly in a letter to Tyrell: “But there are many perhaps millions of propositions in *Mathematiques* which are demonstrable which neither you nor I can demonstrate and which perhaps no man has yet demonstrated or will do before the end of the world.” Locke to Tyrell, 4 August 1690. Locke 1976, volume 4, pages 112-113.

⁴⁵ 2.28.2. “Cousin-german” refers to the child of one’s aunt or uncle. In contemporary English the term would be “first-cousin”.

theory about what these relations consist in, what these relations truly are, or what is required for these relations to obtain. Instead, I have tried to suggest, Locke's interest was in relational components of human thought and the mind's active role in constructing these components.

One final note is required before moving on. Earlier I claimed that Locke's account of our relation-ideas and the text of the *Essay* is completely neutral with respect to the metaphysics of relations. Here, however, I have suggested that my interpretation is distinct from conceptualism, which is a position about the metaphysics of relations. And in arguing for this distinction I have shown that Locke believes that some relations are unrecognized by human minds. One might be tempted to conclude from this that Locke's account of our relation-ideas is *not* entirely neutral with respect to the metaphysics of relations; it now looks like Locke's account rules out conceptualism.

This objection has some merit. I think Locke does rule out this form of conceptualism, call it human conceptualism. But recall that conceptualism holds that the existence of a relation depends on its recognition by a mind with no stipulation about the type of mind involved. Locke believes there are relations that human minds have failed to recognize. But Locke also believes in an omniscient God. So, God could know and recognize the infinite number of relations between objects, and could thereby ground all relations. Of course, there is no positive reason for thinking that Locke would have been attracted to any form of conceptualism. But, it certainly seems that at least one form of conceptualism is still a theoretical possibility for him.

5.2 Textual Objections

In attempting to show that Locke held a position on the metaphysics of relations both Ott and Langton marshal texts from the *Essay* and elsewhere. Because I deny their conclusions it is incumbent on me to reinterpret these texts and show that they admit of alternative readings. The goal of this section is to examine these texts and show that all of them are compatible with my claims that Locke is primarily interested in a psychology of relation-ideas and that the account he gives of the mind's comparative actions floats free of any given metaphysical position on relations.

We can begin with a piece of text which Ott takes to be critical for his claim that Lockean relations reduce to the objects being related:

I doubt not but if we could discover the Figure, Size, Texture, and Motion of the minute Constituent parts of any two Bodies, we should know without Trial several of their Operations one upon another, as we do now the Properties of a Square, or a Triangle. Did we know the Mechanical affections of the Particles of *Rhubarb*, *Hemlock*, *Opium*, and a *Man*, as a Watchmaker does those of a Watch, whereby it performs its Operations, and of a File which by rubbing on them will alter the Figure of any of the wheels, we should be able to tell before Hand, that *Rhubarb* will purge, *Hemlock* kill, and *Opium* make a Man sleep; as well as a Watch-maker can, that a little piece of Paper laid on the Balance, will keep the Watch from going, till it be removed; or that some small part of it, being rubb'd by a File, the Machin would quite lose its Motion, and the Watch go no more. The dissolving of Silver in *aqua fortis*, and Gold in *aqua Regia*, and not *vice versa*, would be then, perhaps, no more difficult to know, than it is to a Smith to understand, why the turning of one Key will open a Lock, and not the turning of another.⁴⁶

This is one passage in which Locke expresses what can be called a “geometric model” of the natural world.⁴⁷ In these passages he seems to speak as though a list of the non-relational

⁴⁶ 4.3.25.

⁴⁷ For other examples, see 2.21.6, 3.11.23, and 4.6.11. As Marleen Rozemond and Gideon Yaffe have pointed out, we should be careful with the language of geometry here. The reasoning is not strictly geometrical, and, in fact, Locke references three different types of reasoning in this passage. See Rozemond and Yaffe 2004, page 394. And for more general discussion of these passages see Stuart 1996.

properties of bodies would be sufficient for determining the relations that hold between them. We could deduce out these relations in just the way that we deduce proofs in geometry.

Ott believes that this supports a reductionist view about relations. He takes the passage to show that if we simply understood the properties of bodies taken individually, then we would know the properties that they have collectively. We would know which relations hold between them. For example, knowing all the features of gold and all the features of aqua regia ($\text{HNO}_3 + 3 \text{HCl}$) would be sufficient for us to learn that a relation holds between them, namely, that gold dissolves in aqua regia. Thus, Ott argues, Lockean relations are not a robust feature of Locke's ontology. Instead, they simply reduce to the objects which are related.

Before we even begin to examine Locke's purposes in this passage I think we should note that, in fact, the passage is a long way from affirming that all relations reduce to the non-relational features of the relata. The passage is importantly qualified. First, Locke does not say that we would know *all* of the operations of bodies upon one another, just that we would know *several*. Second, doubt (and thus not doubting), for Locke, is a degree of belief and not a degree of knowledge. So Locke is only committing himself to the possibility of this claim, not to the claim. Consider the difference between *knowing* that Brazil will win the World Cup and *not doubting* that they will win the World Cup. Third, there is a critical "perhaps" in the final sentence.

We might also question the notion that Locke is explaining relational features of objects through appeal to their non-relational features in this passage. Locke's claim is that if we knew "the Figure, Size, Texture, and Motion" of objects we would have a better sense of how they interact with one another. But it is not at all obvious that figure, size, texture, and

motion are non-relational features of objects. At the very least, we would need a series of textual and philosophical arguments to assure us that they are.⁴⁸

Even leaving aside these concerns, however, it is far from clear that Locke is making a point about metaphysics in this passage. Instead, it seems to me that Locke is making a point about our knowledge. Locke is saying that if we *knew* all about gold or aqua regia or some other substance we would *know* which relations it had. But knowledge, for Locke, has to do with ideas. So I think we should read Locke as merely saying that, counterfactually, if we had superlative ideas of gold, aqua regia, etc. then we would have the right sorts of materials for discovering the interesting connections between those ideas. More evidence for this “epistemic” reading comes from the title of the section in which the quote appears. The section occurs in the part of Book IV where Locke is discussing the reasons for our ignorance, the section prior to the one in question claims that one cause of our ignorance is “Want of simple ideas that men are capable of having, but have not (1) because of their remoteness, or” and the section in which the quote appears is titled “Because of their Minuteness.” I think this shows that in this passage Locke is primarily concerned to illustrate something about our ideas and what we can or cannot learn from them, *not* to demonstrate anything about the ontological status of relations.

Let us now turn to some passages invoked by Langton in support of her view. Again, I think it will be possible to show that in these passages Locke is more concerned with epistemology and the sort of access we have to connections between objects than with the metaphysics undergirding those connections. Here are three passages:

...the Ideas of sensible secondary Qualities, which we have in our Minds, can, by us, be no way deduced from bodily Causes, nor any correspondence or

⁴⁸ Special thanks to Alan Nelson for bringing this to my attention.

connexion be found between them and those primary Qualities which (Experience shows us) produce them in us...we can attribute their connexion to nothing else, but the arbitrary Determination of that All-wise Agent.⁴⁹

In some of our *Ideas* there are certain Relations, Habitudes, and Connexions, so visibly included in the Nature of the *Ideas* themselves, that we cannot conceive them separable from them, by any Power whatsoever...But the coherence and continuity of the parts of Matter; the production of Sensation in us of Colours and sounds, *etc.* by impulse and motion: nay, the original rules and Communication of Motion being such, wherein we can discover no natural connexion with any *Ideas* we have, we cannot but ascribe them to the arbitrary Will and good pleasure of the Wise Architect.⁵⁰

the gravitation of matter towards matter, by ways inconceivable to me, is not only a demonstration that God can, if he please, put into bodies power and ways of operation above what can be derived from our idea of body...but also an unquestionable and every where visible instance that he has done so.⁵¹

Langton's claim is that in these first two passages, *pace* the reductionist, there is no relation deducible between our ideas and the objects that produce them. This means that God must have arbitrarily created this relation without basing it on the non-relational properties of these objects. So there is some third entity required for the relation to obtain. Langton's thought about the second quote is similar. She reads this as saying that the relations between bodies that cause their mutual attraction is not something that depends on the non-relational properties of matter. Again, God plays a critical role in ensuring these relations obtain and so there is something more to the relation than the relata. Langton's conclusion is that "These powers owe their being to God's good pleasure. No angel can infer from matter's primary

⁴⁹ 4.3.28.

⁵⁰ 4.3.29.

⁵¹ *Second Reply to Stillingfleet*. Locke 1823, volume 4, page 467-468.

qualities its powers of gravity, cohesion, and (perhaps) impenetrability, nor perhaps any of its causal powers.”⁵²

Locke does admit that matter coheres, that matter is gravitationally attracted to other matter, that sensations are produced in us, and the like. And Locke admits that we do not understand how or why these things happen. But it is far from clear that Locke, in these passages, means to be discussing the metaphysics of relations. Instead, it seems to me that Locke is discussing our ideas and what we can and cannot discover from them. Locke claims that some of our ideas (those of triangles, for example) are good insofar as they let us make fruitful comparisons and interesting discoveries. But some of our ideas (of gold, for example) are rather impoverished, they do not allow us to make these fruitful comparisons. For example, we cannot get from our idea of matter (solid extended substance) that it should be mutually attracted to other matter. There is simply nothing in our idea of matter that tells us why it should gravitationally attract. But all that this shows us is that our idea of matter is lacking in some regard. It does not show us that, as a matter of metaphysical fact, God has decided to make certain relations obtain.

The same is true for the relations that hold between bodies and minds whereby bodies produce ideas in minds. Locke does allow that this relation obtains and that it is mysterious to us. But again, I think he is better understood as making a point about the limits of our knowledge than as making a point about the metaphysics of the relationship between mind and body. The title for the section of the *Essay* from which the first quote is taken supports my line of interpretation. The section is titled “Secondly, Another cause [of our great

⁵² Langton 2000, page 89.

ignorance]. Want of a discoverable Connexion between Ideas we have.”⁵³ On my reading of this passage, Locke is simply making the (distinctively Lockean) point that reality outstrips our ideas. Our ideas are insufficient to tell us everything about the relations that obtain between objects in the world. To draw inferences about the ontic status of relations from our ignorance seems a dangerous move.

One piece of text that is used as evidence both by Ott and Langton comes from 2.25.8. Here Locke writes “this farther may be considered concerning Relation, That though it be not contained in the real existence of Things, but something extraneous, and superinduced...” Ott takes this to mean that relations do not feature in the fundamental level of reality. The suggestion of the reductionist is that we read this passage as saying that if one were to make a list of all the objects (real things) in the world, relations would not be one of the items on the list. So, on this reading, Locke is explicit that relations, insofar as they do exist, must be parasitic on something else.⁵⁴

Langton offers an alternative reading. According to her we should understand “contain in” as equivalent to “supervene on.”⁵⁵ Thus the passage reads that relations do not supervene on objects, and therefore, there must be some third entity involved to produce a relation. I believe Langton seeks to read “contained in” as “entailed by.” Consider the sense in which the conclusion of a deductive argument is said to be contained in its premises. Or, to give an example which might have been familiar to some of Locke’s readers, consider the

⁵³ 4.3.28 Section Title. And the section head for the following section, from which the second quote is drawn: “Instances”.

⁵⁴ The two obvious candidates are mental acts and (the non-relational features of) material objects. The former was discussed in the previous section, Ott opts for the latter.

⁵⁵ Langton 2000, page 80.

sense in which Hobbes says that the natural law and the civil law contain one another.⁵⁶

Having taken the first clause to mean that objects alone are insufficient to furnish us with relations, the non-reductionist can turn her attention to the second clause. What does Locke mean when he says that relations are extraneous and superinduced? “Superinduce” is a slightly dated word, but the definitions from the OED which seem to fit Locke’s sense are ‘To bring in over and above, or ‘on the top of’, something already present; to introduce in addition (esp. something extraneous)’ and “In a physical sense, To bring, draw, deposit, etc. *over* or *upon* a thing as a covering or addition.” Langton claims that the act of superinduction is God’s. God is the one who must create relations or force relations to obtain in a special separate act.

Now the very fact that both Langton and Ott can use the same passage to support opposing (and mutually exclusive) positions should give us pause. The fact that neither seems to stretch the obvious sense of Locke’s words might give us reason to think that this passage, because so open to interpretation, is of rather limited value. I think our skepticism about the worth of this passage can only be heightened when we examine the context in which it arises. Simply put, there is nothing in the passage which suggests that Locke takes himself to be making an important point in this sentence. And there is nothing in the passage which suggests that Locke takes himself to be making a metaphysical point in this sentence. He immediately moves on to talk about the sense in which our relation-ideas are often better than our ideas of the relata; *this* is the point Locke wishes to make here.

Nevertheless, it is incumbent on me to offer an alternative reading of this sentence. My suggestion is that we read this claim about containment as having to do with the

⁵⁶ *Leviathan*, 2.26.4. Hobbes 1994.

compositionality of Lockean ideas. Locke holds that all of our complex ideas, no matter how complex, are composed of simple ideas received from sensation and reflection. Thus my complex idea of an apple is composed of the ideas of red, roundness, sweetness, etc.⁵⁷ Given these commitments, it seems reasonable to say that the idea of red is contained in the idea of an apple and that the idea of wisdom is not contained in the idea of an apple. So what is it that Locke is suggesting when he claims that relations are not “contained in the real existence of things”? On my view Locke is just saying that to understand a thing’s relations we have to look outside of the idea of that thing.

Consider a passage from slightly earlier in the chapter: “Thus when the Mind considers Cajus, as such a positive Being, it takes nothing in that Idea, but what really exists in Cajus; v.g. when I consider him, as a Man, I have nothing in my Mind, but the complex Idea of the Species, Man.”⁵⁸ Here Locke is suggesting that to understand that Caius is a man, the mind need not compare its idea to Caius to any of its other ideas. The idea of man is contained in Caius, it is one of the ideas which (along with, perhaps, the idea of dark hair and the idea of wisdom) partially constitutes the mind’s complex idea of Caius. By contrast, the mind cannot get that Caius is a husband without considering two distinct ideas. The mind must consider its idea of Caius, but also one of its ideas which is distinct from Caius, specifically, its idea of Sempronia: “But when I give Cajus the name Husband, I intimate some other Person... in the above mentioned instance, the Contract, and Ceremony of Marriage with Sempronia, is the occasion of the Denomination.”⁵⁹ Locke has several notions

⁵⁷ And these ideas themselves might be composed of other ideas. The only point that is relevant for Locke is that eventually all of our complex ideas bottom out in simple ideas.

⁵⁸ 2.25.1.

⁵⁹ 2.25.1. One hopes this is a different Caius and Sempronia from the parsley-bed example.

of “containment” at work in the *Essay* but this understanding of containment as partial constitution of a complex ideas is certainly one of them. There are a great number of examples where Locke seems to have just this in mind.⁶⁰

One might wonder though, whether I am doing justice to Locke’s language of the “real existence of things.” After all, why should one think that Locke is talking about ideas here? It seems perhaps more plausible to read him as talking about objects in the external world. But consider a passage which comes slightly later and in which Locke uses similar language about “real existence”:

...all Words, that necessarily lead the Mind to any other *Ideas*, than are supposed to really exist in that thing, to which the Word is applied, are *relative words*. v.g. *A Man Black, Merry, Thoughtful, Thirsty, Angry, Extended*; these, and the like, are absolute, because they neither signify nor intimate any thing, but what does, or is supposed to really exist in the Man thus denominated: But *Father, Brother, King, Husband, Blacker, Merrier, etc.* are Words, which together with the thing they denominate, imply also something else separate, and exterior to the existence of the thing.⁶¹

One way to argue that Locke is talking about our ideas here is to emphasize the beginning of the passage where Locke is speaking about which words lead the mind to which ideas. The

⁶⁰ The idea of theft contains many different ideas: “Secondly, there are others compounded of simple ideas of several kinds, put together to make one complex one; v.g. beauty, consisting of a certain composition of colour and figure, causing delight to the beholder; theft, which being the concealed change of the possession of any thing, without the consent of the proprietor, **contains**, as is visible, a combination of several ideas of several kinds: And these I call mixed modes.” 2.12.5. We can become confused about an idea when one of its constituent parts is confused: “For being satisfied in that part of the idea, which we have clear; and the name which is familiar to us, being applied to the whole, **containing** that part also which is imperfect and obscure: We are apt to use it for that confused part, and draw deductions from it, in the obscure part of its signification, as confidently as we do from the other.” 2.29.14 Certain ideas are not contained in our ideas of substances: “But it is plain, that in our complex ideas of substances are not **contained** such ideas, on which all the other qualities, that are to be found in them do depend.” 2.31.6 Ideas of modes are only supposed to contain certain other ideas: “Because whatever complex ideas I have of any mode, it hath no reference to any pattern existing, and made by nature: It is not supposed to **contain** in it any other ideas than what it hath...” 2.32.17 “all the simple ideas **contained** and united in that complex one” 3.6.44 “So that let our complex idea of any species of substances be what it will, we can hardly, from the simple ideas **contained** in it, certainly determine the necessary co-existence of any other quality whatsoever.” 4.3.14

⁶¹ 2.25.10.

emphasis is on the mind and the ideas it considers or compares when faced with certain words, the emphasis is not on which words refer to which objects or properties in the world.⁶²

Another way to motivate the thought that Locke is making an epistemic and not a metaphysical argument here is to focus on his inclusion of “black” in the list of properties which are non-relational.⁶³ Black is a color, which is supposed to be a secondary quality for Locke. Ideas of secondary qualities are supposed to be relational, they are about effects which one substance can have on another.⁶⁴ Those who seek to read Locke as making a metaphysical point in this passage are forced to read Locke as making an error in this passage; he has miscategorized black.⁶⁵ But if we read Locke as making an epistemic point, one solely concerned with the connections that hold between our ideas, and not concerned with the connections that hold between bodies we can allow that Locke did not make such an elementary error.

Consider the following passage: “Thirdly, what ideas we have of substances, I have above shewed. Now those ideas have in the mind a double reference: 1. Sometimes they are referred to a supposed real essence of each species of things. 2. Sometimes they are only designed to be pictures and representations in the mind of things that do exist by ideas of those qualities that are discoverable in them. In both which ways, these copies of those

⁶² In fact, Locke thinks words are only used appropriately to refer to ideas. Using words to refer to objects in the world is one of the primary ways in which communication goes astray and language is abused.

⁶³ The same point can be made, *mutatis mutandi*, with regard to the passage at 2.24.1 where Locke declares that Caius’ whiteness is not a relational feature of Caius.

⁶⁴ A quick argument for this claim. Locke identifies qualities with powers (2.8.8) and he writes that ideas of powers contain relations (2.21.3).

⁶⁵ Langton allows that, on her reading, Locke has made a mistake here. But says that it is understandable because he points out that others are liable to this same error at 4.6.11. See Langton 2000, page 80, note 10. Langton also notes that, on her reading, he would have repeated this error with respect to white at 2.24.1. See Langton 2000, page 86.

originals and archetypes are imperfect and inadequate.”⁶⁶ What I think Locke means to say in this passage, and those that follow it, is that there is a difference in thinking about “Caius as He Appears in My Mind” and “The Object in the World Which Causes ‘Caius as He Appears in My Mind’”. Locke’s point here is similar to Descartes’ in the Third Meditation where he claims that he has two distinct ideas of the sun: one from the senses and one from astronomy.⁶⁷ One of my ideas of Caius (the one of Caius as a metaphysical being in the world) contains the idea of a power to produce black in a mind. Which is to say that in the idea of Caius as a metaphysical being, black is a relational property. But in my other idea of Caius (my unreflective, pre-philosophical, idea of Caius) black is a really existing feature of Caius. It is not relational.

Given this, I think there is a perfectly fair reading of Locke’s talk of containment in the real existence of things which allows that he is talking about our ideas of things, and not about objects in the world. Further, this reading does not impute a considerable blunder to Locke. So on my view, when Locke says that “relations are not contained in the real existence of things”, he means to say that to include an idea in a relation-idea we need to consider it alongside another idea. But what about the second half of the passage where Locke writes that “relations are something extraneous and superinduced”?

Recall that Langton takes this half of Locke’s claim as evidence for her view. The idea is that some relations obtain that would not have done so otherwise in virtue of some special action on God’s part. God has added some relations to the world. I think that

⁶⁶ 2.31.6.

⁶⁷ Descartes 1985, volume 2, page 27: “For example, there are two different ideas of the sun which I find within me. One of them, which is acquired as it were from the senses and which is a prime example of an idea which I reckon to come from an external source, makes the sun appear very small. The other idea is based on astronomical reasoning, that is, it is derived from certain notions which are innate in me... and this idea shows the sun to be several times larger than the earth.”

Langton is right to insist that there is something agential about the notion of “superinduction.” But I do not think that her reading is the only one available. My suggestion is that we let the mind be the agent which is superinducing an extraneous idea.

Let us return the example of considering Caius as a husband. Already we learned that for the mind to consider Caius as a husband it must look beyond its idea of Caius to some other idea. Specifically, it must look to its idea of Sempronia. There seems to be no obstacle to saying that the idea of Sempronia is extraneous to the idea of Caius. The two are distinct ideas, and the mind could have one without having the other. And there seems to be no obstacle to saying that when the mind considers the idea of Caius as a husband it cannot consider him as a husband without bringing in something additional, without superinducing the idea of Sempronia (or the abstract idea of a wife).

6. Two Consequences

Before concluding I want to briefly consider two consequences of the view I have defended above. It is worth noting that, if the view I have defended is correct, there should be a great number of consequences. This is because Locke thinks that much of our cognitive economy depends on relation-ideas: claims about identity, mathematics, ethics, space and time, and a large number of other topics. But for present purposes we can focus on just two consequences.

The first has to do with our understanding of Locke on causation. There are, to paint with broad strokes, two approaches to causation in early modern philosophy. One approach seeks to describe causal processes. The goal is to determine what occurs at the fundamental metaphysical level of reality when one thing causes another. This is the approach to

causation found in thinkers like Descartes and Malebranche.⁶⁸ Another approach seeks to explain human thinking about causal processes. The goal here is to describe how and why people think about (real or alleged) causal events in the way that they do. This is the approach to causation found in Hume.⁶⁹ Given these two approaches to causation, one might naturally wonder which camp Locke falls into.

I think that the argument about Lockean relation-ideas and relations which I have offered in this chapter, if successful, can settle the question. The reason for this is that Locke is very explicit that cause and effect is a type of relation-idea. The final section of 2.25 claims that “Having laid down these premises concerning relation in general, I shall now proceed to show, in some instances, how all the ideas we have of relation are made up, as the others are, only of simple ideas...I shall begin with the most comprehensive relation...and that is the relation of *cause* and *effect*.”⁷⁰ So Locke makes it clear that his discussion of causation in 2.25 is a case-study in the way that relation-ideas work; causal relation-ideas are a proper-subset of relation-ideas.

If it is the case that causal relation-ideas are just one species of relation-ideas, then anything which is true of Lockean relation-ideas should be true *a fortiori* for Lockean causation. I have offered an argument in this chapter that Locke does not intend to discuss the metaphysics of relations, but only to discuss the mind’s comparison of ideas. I think this

⁶⁸ Of course, on occasion these thinkers also take it upon themselves to discuss causal thinking in humans. For example, they are sometimes keen to dismiss Aristotelian or common-sense thinking about causation as false. Or, having established a given metaphysics of causation they are sometimes keen to show how it is that we come to know about and understand it.

⁶⁹ Of course, these thinkers might also have something to say about causation in the world. For example, one might read Hume as offering his positive account of our causal thinking only after offering a negative account in which he shows that there is no metaphysical causation in the external world.

⁷⁰ 2.25.11.

lets us conclude that Locke was more like Hume than like Descartes or Malebranche in his approach to causation. Locke is attempting, in 2.26, to tell us about our causal thinking: about the sorts of causal attributions and judgments which we make and about the way in which we cognize causal processes. He is not attempting to tell us what causal interactions *are or consist in*.

Further evidence for this comes from the language which Locke uses in this chapter. Consider the following quote:

We *consider* fire, in relation to ashes, as cause, and the ashes, as effect. So that whatever is *considered* by us to conduce or operate to the producing any particular simple idea, or collection of simple ideas...which did not before exist, hath thereby *in our minds* the relation of cause, and so is denominated by us.⁷¹

For to have the idea of cause and effect, it suffices to *consider* any simple idea or substance, as beginning to exist, by the operation of some other, *without knowing the manner of that operation*.⁷²

This quote indicates that the emphasis of Locke's account of causation is on the mind and the ways it is apt to consider different objects. Thus, his emphasis is on what the mind is *considering* to be the case. Locke's emphasis is not on the actual causal processes in the world (or even on the degree to which the mind is correct in making the attributions it does). This is why Locke can allow that *any* idea or *whatever* object can be judged a cause. And this also explains Locke's complete lack of concern with the *manner* in which changes are produced. Locke is interested in a psychology of causal thought and cognition, not a metaphysics of causation.

⁷¹ 2.26.1. Emphasis added.

⁷² 2.26.2. Emphasis added.

The second consequence of the view defended in this chapter pertains to our understanding of Lockean superaddition. The topic of superaddition has been the source of much confusion and has been the focus of much debate in recent scholarship. The main line of debate has been over the metaphysical nature of superaddition. One side holds that superaddition is compatible with mechanism. To say that God superadds powers to objects is just to say that he organizes their corpuscles in a complex manner which is sufficient to give them the powers in question. The other side of the debate alleges that superadded powers cannot operate mechanically and must be the product of a semi-miraculous act by God.⁷³

Ott takes his reductionism about relations to show that superadded powers are compatible with a thoroughgoing mechanism. Langton takes non-reductionism to show that superadded powers are incompatible with mechanism. If I am correct that neither reductionism nor non-reductionism is correct then we are not forced into a position on superaddition. And, if I am correct that Ott and Langton are wrong to look for a metaphysics of relations in Locke then we can conclude that their method for settling the debate over superaddition is flawed.

7. Conclusion

I have argued that Locke's primary purpose in discussing relations and relation-ideas in the *Essay* was to detail the various ways in which the mind compares the ideas it has. I noted that Locke consistently uses psychological language in the relevant chapters and that the scope of his claims and of the items he takes as explananda are consistent with a psychological approach to the topic. I provided arguments against alternative, metaphysical,

⁷³ See Chapters 4 and 5 for further discussion.

understandings of Locke's claims about relations and relation-ideas. Considerations about the non-representative nature of relation-ideas were at the center of these arguments. I considered an objection to my view, examined and interpreted some controversial texts relevant to the topic, and highlighted some consequences of my view.

4. Lockean Superaddition and Lockean Humility

The essences also of substantiall beings are beyond our ken. The manner also how nature in this great machin of the world produces the severall phaenomena...is...what I thinke lies also out of the reach of our understandings. That wch seems to me to be suited to the end of man & lie levell to his understanding is the improvement of natural experimts for the conveniencys of this life & the way of ordering himself so as to attain happinesse in the other....

-John Locke¹

1. Introduction

Locke infamously wrote that God superadded powers to material objects. But what this act of superaddition entails is opaque. This has given rise to what I will call the problem of superaddition. Did Locke believe that some bodies have non-natural powers? More specifically, did Locke believe that some bodies have powers which do not flow from their nature, or real essence? This question has split commentators. Some commentators, like Margaret Wilson, Matthew Stuart, and Rae Langton have argued that the answer is yes.² Other commentators, like Michael Ayers, Lisa Downing, and Walter Ott have argued that the

¹ Ms. Locke f.2, page 127.

² Wilson 1979, Wilson 1982, Stuart 1998, Langton 2000.

answer is no.³ The view I will defend in this chapter holds that both of these positions are mistaken.

My goal in this chapter is to show that Locke was agnostic on this question. Locke was unsure whether God had given bodies real essences capable of generating observed phenomena or whether something more was required. My argument, in brief, is as follows: Locke believed that the scope of human understanding was extremely limited. As a consequence of this, we have no understanding of the mechanisms underlying various natural phenomena. Put differently, reality outstrips our ability to understand it. As a result, we cannot be sure whether a given phenomenon requires anything more than the interactions between the real essences of material bodies. So Locke's epistemology demands an agnostic response to the question of superaddition.

My plan for the chapter is as follows. In Section 2 I will set up the problem and introduce some of the critical texts. Section 3 will cover what is at stake in the debate. Section 4 will describe some features of Locke's epistemology and Section 5 will show how those features necessitate an agnostic position on the question. In section 6 I will show how Locke's position coheres nicely with those of two seventeenth century scientists. And in Section 7 I will discuss other interpretations of Locke on superaddition and other ways of understanding the debate.

2. The Problem of Superaddition

There is a significant amount of primary text which has helped generate the question of superaddition in Locke. I will discuss many of the relevant passages in this chapter but we

³ Ayers 1981, Downing 2007, Ott 2009. See also Jacobs and McNeish 1997.

can begin with two. These two passages correlate with the two phenomena most central to the debate over superaddition: gravitation and thinking matter.⁴

In the early editions of the *Essay* Locke claimed that matter could only act on matter through local motion.⁵ Edward Stillingfleet offered an objection to Locke on the grounds that Locke accepted the findings of Newton's *Principia*. The *Principia* described a phenomenon, gravitation, in which matter acted on other matter but for which there was no explanation based on local motion. Here is part of Locke's response to Stillingfleet:

The gravitation of matter towards matter, by ways inconceivable to me, is not only a demonstration that God can, if he pleases, put into bodies powers and ways of operation, above what can be derived from our idea of body, or can be explained by what we know of matter, but also an unquestionable and every where visible instance, that he has done so.⁶

The second passage has to do with the possibility of thinking matter. Locke acknowledges the obvious point that we are thinking beings. But Locke is also clued in to the fact that our understanding of what it is to be a thinking being is rather tenuous. Given our uncertainty about the metaphysics underpinning thought, it is natural to ask whether material things could think. Here is part of what Locke has to say on the topic:

It being, in respect of our Notions, not much more remote from our Comprehension to conceive, that GOD can, if he pleases, superadd to Matter a Faculty of Thinking, than that he should superadd to it another Substance, with a Faculty of Thinking... For I see no contradiction in it, that the first

⁴ There is some case for making sensation (or perception) a third central topic in this debate. However, there are also good reasons for excluding it. Specifically, sensation is not (obviously) a natural process. If we understand sensation to be an interaction between a mind or soul and a material body and natural processes to be interactions only between material bodies then sensation will be excluded. Nevertheless, the position I develop with regard to gravitation and thinking matter can be applied, *mutatis mutandi*, to perception.

⁵ 2.8.11 in the first three editions of the *Essay*.

⁶ Locke 1823, volume 4, page 467-468.

eternal thinking Being should, if he please, give to certain Systems of created senseless matter, put together as he thinks fit, some degrees of sense, perception, and thought.⁷

These two passages (and others like them) have proven to be controversial for two reasons. The first reason is that they are very confusing. The exact position Locke is taking is both mysterious and underdetermined by the text. Locke simply fails to spend a great deal of time making his views on superaddition clear. The second, and more important, reason why these passages are controversial is a *prima facie* tension between the position they outline and one of Locke's other positions. There are a number of places in the *Essay* where Locke seems to hold that all of an object's features and properties flow from its nature (or real essence).⁸ Here is an example: "Had we such *Ideas* of Substances, as to know what real Constitutions produce those sensible Qualities we find in them, and how those Qualities flowed from thence, we could, by the specifick *Ideas* of their real Essences in our own Minds, more certainly find out their properties."⁹ So Locke's "official position" holds that bodies do not have non-natural properties. All of the properties of bodies should be (at least in principle) explained by their real essences, from which all the properties flow. Put differently, there are no properties of an object which are not caused by its real essence.

The two passages highlighted above, however, do not seem to fit with this picture. In the first, Locke says that the power to gravitate is beyond the capacity of mere matter. And in the second, he suggests that thought is something over and above matter, something additional that must be specially added by God. So Locke seems to be claiming that there are

⁷ 4.3.6.

⁸ 2.23.3, 3.3.17, 3.3.18, 3.6.6, 4.3.25, 4.12.9.

⁹ 4.6.11. The passage continues: "and to know the Properties of *Gold*, it would be no more necessary, that *Gold* should exist, and that we should make Experiments upon it, than it is necessary for the knowing the Properties of a Triangle, that a Triangle should exist..." Thus, this view of Locke's is sometimes termed his "geometric model" of nature.

properties of material objects (gravitation and thought) that are unrelated to, or that do not flow from, their essences or natures.¹⁰

So the idea that there are contradictory tendencies in Locke's thought has been at the heart of the debate. On one side, some have argued that although Locke thinks many or most of an object's properties are natural, Locke's statements about gravitation and thinking matter show that he did not believe this to be true of *all* properties of objects. Locke believes that some non-natural properties are given to objects by God. Others have argued that Locke's true position is that all properties of all objects do, in fact, flow from their essences. According to these interpreters the passages which seem to suggest that God added non-natural properties, when interpreted properly, do not actually commit Locke to non-natural properties.

3. What is at Stake?

So much for what the debate is *about*. Why is it *important*? Why should we care which of these positions was Locke's? The answer is that there is a lot at stake. Here is a non-exhaustive list of the pressing questions that are related to superaddition: 1) What is Locke's position on the ontology of human beings? Our understanding of Locke's relation to Hobbesian materialism, on the one hand, and Cartesian dualism, on the other, will depend on how we interpret Locke's claims about superaddition. 2) What is Locke's relationship to the

¹⁰ Locke's use of the word "superaddition" offers some limited support for this reading. The primary 17th century usage of "superaddition" seems to have been in theologico-moral contexts (eg. "superadded grace" or "superadded duties") and in logico-organizational contexts (eg. a name superadded to a title page or an argument superadded to others). But there are some uses in natural philosophical contexts which support the idea that superadded properties are extrinsic, non-natural, or added from without. For example, Allestree 1678, page 85: "Fire, by it's natural determination, necessary burns the wood, and it needs no impulse, or superadded motion to determin it..." and Hale 1677, page 8: "And this Entity I call *Vis*, or *Virtus activa*, superadded to Matter, and giving immediately those Motions to it, that are specifically appropriate to that *Vis*, or *Virtus Activa*, and without which, Matter would be stupid, dull, unactive, and always at rest in it self, unless accidentally moved *ab extrinseco*."

mechanist hypothesis? And, by extension, to Robert Boyle? Depending on how we read the claims about superaddition, Locke may have either abandoned mechanism or bet the family farm on it. 3) What is Locke's relationship to Newton and the Newtonian achievement? The way that Locke did or did not understand gravitation and Newton's methodology is intimately linked to his position on superaddition. 4) What were Locke's views about scientific explanation? Did all scientific explanation have to make appeal to the intelligible components of the mechanist hypothesis? Or could some explanations end in the arbitrary will of God or in irreducible quasi-Aristotelian powers? 5) How did Locke think about the role of God in the natural world? Did he offer a deist (or proto-deist) view of nature? Or did he instead have the hand of the divine pressed immediately upon many terrestrial processes?

There is also a more synoptic way to describe what is at stake. The question about superaddition can be understood as a question about *what kind of philosopher Locke was*. Some of those who deny that Locke accepted the possibility of non-natural properties do so (at least in part) precisely because of a desire to hold him up as a champion of a distinctively modern and naturalistic way of looking at the world. I think this motivates Michael Ayers' claim that if Locke embraced superadded properties then his entire carefully orchestrated attack on the Aristotelians would fall apart.¹¹ In Walter Ott we get a similar story. Ott lets Locke serve as the hero in his survey of causation and laws of nature in early modern philosophy. According to him, it is finally in Locke that we see "a thoroughgoing bottom-up

¹¹ "For if [Locke] let in the possibility that the powers or phenomenal properties should belong to things as a matter of brute or miraculous fact not naturally intelligible, Locke's whole carefully constructed philosophy of science and his support for the corpuscularian case against the Aristotelians would collapse. In effect, he would be allowing the despised doctrine of "real accidents"..." Ayers 1975, page 22.

mechanism that is neither concurrentist nor ‘magical.’”¹² On the other side of the debate it seems to me that commentators are especially keen to preserve Locke’s pious and deeply theistic view of the universe. This explains the attempts by Margaret Wilson, Matthew Stuart, and Rae Langton to argue that Locke adhered to a particularly strong form of voluntarism about the laws of nature.¹³

4. Lockean Humility

The goal of this section is to describe the sort of humility that lies at the heart of Locke’s epistemology. I think that there are two central components: 1) The claim that we know very little and were designed to know very little. 2) The claim that we err seriously when we fail to acknowledge the strict limits to our knowledge. In the rest of this section I will describe both of these claims in further detail and demonstrate that, in fact, Locke was deeply committed to each. Following that, I will discuss a specific argument of Locke’s – the central claim of which is that when our ideas are inadequate we must not rely on negative arguments.

4.1 Strict Limits to Human Knowledge

The claim that there are strict limits to our knowledge and cognitive abilities is one of the most central claims of the *Essay*.¹⁴ As Locke puts it: “the *Comprehension* of our

¹² Ott 2009, page 134. And a very similar position is taken in Lennon 1994. Lennon conceives of 17th century philosophy as a battle between the gods and the giants. His sympathies lie solely with the latter group. Part of his goal was to develop a Locke who could be a champion for the giant’s naturalized view of the universe.

¹³ Wilson 1979, Wilson 1982, Stuart 1998, Langton 2000.

¹⁴ One does not have to read past the title page of the book before this becomes clear. The two epigraphs Locke chose convey the sentiment quite unequivocally: “As thou knowest not what is the way of the Spirit, nor how the bones do grow in the Womb of her that is with Child; even so thou knowest not the works of God, who maketh all things.” (Ecclesiastes 11:5) and “Quam bellum est velle consiteri potius nescire quod nescias, quam

Understandings, comes exceeding[ly] short of the vast Extent of Things.”¹⁵ Demarcating the limits of human knowledge was a primary aim of the *Essay*.¹⁶ And once the lines are drawn it becomes evident that our knowledge is very limited indeed.¹⁷ For example, in the chapter specifically dedicated to ‘the Extent of Human Knowledge’ Locke writes that “it is evident, that *the extent of our Knowledge* comes not only short of the reality of Things, but even of the extent of our own *Ideas*.”¹⁸

One might wonder why our knowledge is so limited. What motivates this rather dismal view of our intellectual capacities? The answer lies in theology. Locke believes that we were designed and created by a benevolent God. More importantly, he believes that our faculties were designed with certain ends in sight. On this picture, our faculties (including our intellect and our understanding) have as their primary goal not the acquisition of true beliefs or adequate knowledge about the real world. Instead, they were designed and were given to us with the dual aims of 1) allowing us to survive and find comforts in this life and 2) ensuring the salvation of our souls in the life to come. And, of course, living a happy life and ensuring salvation can be accomplished even with a set of radically false or misleading

ista effutientem nauseare, atque ipsum sibi displicere” which translates roughly as “How fine it is to be willing to confess to not know what you do not know rather than to grow ill spewing forth such stuff and to displease oneself.” (Cicero, *De Natura Deorum*, Bk. 1).

¹⁵ 1.1.5.

¹⁶ 1.1.3: “It is therefore worth while, to search out the *Bounds* between Opinion and Knowledge; and examine by what Measures, in things, whereof we have no certain Knowledge, we ought to regulate our Assent, and moderate our Perswasions.”

¹⁷ 3.6.9: “The workmanship of the all-wise and powerful God in the great fabric of the universe, and every part thereof, further exceeds the capacity and comprehension of the most inquisitive and intelligent man, than the best contrivance of the most ingenious man doth the conceptions of the most ignorant of rational creatures.” 4.3.24: “When we consider the vast distance of the known and visible parts of the world, and the Reasons we have to think, that what lies within our Ken, is but a small part of the immense Universe, we shall then discover an huge Abyss of Ignorance.” See also 4.3.22.

¹⁸ 4.3.6

beliefs about the world. Indeed, false or misleading beliefs about the world might even be beneficial for accomplishing these goals. So Locke did not see our great ignorance as a disadvantage. Instead, his position was that we should be pleased that the faculties we have are so well suited to our condition. We see this in the following quote: “Men have Reason to be well satisfied with what God hath thought fit for them, since he has given them... [1] Whatsoever is necessary for the Conveniences of Life, and [2] Information of Vertue; and has put within the reach of their Discovery [1] the comfortable Provision for this Life and [2] the Way that leads to a better.”¹⁹

Locke’s claims about the narrow scope of human understanding extend beyond general remarks. Most important for our purposes is Locke’s nescience about material bodies and scientific processes. The first point to make with respect to our ignorance of material bodies is that, according to Locke, we have only the slightest grasp of what substance, itself, *is*. Our idea of substance is paradigmatically confused.²⁰ More important, however, is Locke’s well-known skepticism about real essences. Recall from above that the real essence of a substance is supposed to be its nature or constitution. It is supposed to explain or cause the other features and properties of an object. But Locke is adamant that we have no knowledge of these real essences.²¹

Worse than the fact that these real essences are unknown to us is the fact that they are in principle unknowable to us.²² There are two basic reasons for this. The first, and most

¹⁹ 1.1.5, see also 2.23.12.

²⁰ 2.12.6, 2.13.18-20, 2.23.3, 3.6.21.

²¹ 3.3.18, 3.6.9, 4.3.26.

²² 3.6.9: “...by their real essences, that are so far from our discovery or comprehension.” Here, for example, it is not just the discovery that is the problem, it is our inability to *comprehend* real essences. I recognize that claiming real essences are in principle unknowable is controversial. However, I think nothing of maximal

important, is that our only access to material objects is through qualitative experience. My only shot at accessing the real essence of a violet, for example, is by noticing things like its production of ideas of blue in me. But Locke thinks that the law governing the relation between causes of sensory ideas in us and the sensory ideas themselves is unknowable. He says it is just a product of God's arbitrary choice.²³ The second reason that real essences are, in principle, unknowable has to do with the relations that hold between material objects. Locke thinks that for any given phenomenon it will be unclear which (and how many) objects contributed to the production of that phenomenon.²⁴ We can never tell whether a single object produced an effect or whether that object was actually interacting with one or more objects in the production of that effect: "there is not so complete and perfect a part that we know of nature, which does not owe the being it has, and the excellences of it, to its neighbours..."²⁵ So our ignorance of real essences presents an insurmountable barrier to our knowledge of material objects.²⁶

Locke's famous metaphor is especially helpful here. Locke's writes that our position with regard to material bodies is like the position of a farmer looking at the exterior of the

importance hangs on it. The claim that they are contingently unknown is enough for the argument of this chapter.

²³ 2.32.14-15, 4.3.12-13, 4.3.28-29. For a more developed account of this obstacle to understanding real essences in Locke see Jones 2007, especially pages 673-679. Note also an interesting parallel to Descartes' examination of the wax in the Second Meditation. Descartes fails to learn anything about the wax, but *does* learn a great deal about himself *qua* thinking thing.

²⁴ 4.6.11.

²⁵ 4.6.11. Part of the difficulty here may also be our ignorance of which powers certain bodies have: "...I doubt not, but there are a thousand Changes, that Bodies we daily handle, have a Power to cause in one another, which we never suspect..." 2.23.9.

²⁶ Attentive readers may have noticed that the two arguments I consider in this paragraph are just variations on a theme. More precisely, the first argument is a special instance of the more general second argument. In the first sort of case *we* are the object which is contributing to the phenomena allegedly "produced" by the object under consideration.

tremendously complex astronomical clock in the cathedral at Strasbourg.²⁷ The farmer, presumably unacquainted with the horological sciences, would have no way of determining what was causing the intricate displays to operate. And even a talented watchmaker would be unable to determine if the motions of the clock's face were the product of a spring mechanism, a weight mechanism, a pendulum, a person hiding inside the clock and moving the hands manually, a ghost, or some mechanism unknown to her. Without actually breaking into the clock's casing, reverse engineering would be impossible. So, in a sense, the problem with learning about real essences is the fact that our access to them is mediated in such a way that it is impossible to "work our way back" to them.

So much for Locke's nescience about material objects themselves. What does Locke say about our knowledge of causal processes? Unsurprisingly, here Locke also thinks that we are, for the most part, in the dark. As he puts it: "how much the being and operation of particular substances in this our globe depends on causes utterly beyond our view, is impossible to determine."²⁸ His view is that often when we discuss causal processes we have a clear idea of a particular effect, and we attribute the production of that effect to a particular agent but we have no idea of the *mechanism* responsible for bringing the effect about.²⁹ The claim that we can conceptualize causal relations even when we are ignorant of

²⁷ 3.6.3, 3.6.9. For details about the clock see Bach, Rieb, Wilhelm, and Acker 1992.

²⁸ 4.6.11. Or §190 of *Some Thoughts Concerning Education*: "The works of Nature are contrived by a Wisdom, and operate by ways too far surpassing our Faculties to discover, or Capacities to conceive, for us ever to be able to reduce them into a Science." Locke 1989, page 245.

²⁹ 4.16.12: "Concerning the manner of operation in most parts of the works of nature: wherein, though we see the sensible effects, yet their causes are unknown, and we perceive not the ways and manner how they are produced. We see animals are generated, nourished, and move; the loadstone draws iron; and the parts of a candle, successively melting, turn into flame, and give us both light and heat. These and the like effects we see and know: but the causes that operate, and the manner they are produced in, we can only guess and probably conjecture." Also 2.22.11 has it that when a "country-man" says that cold freezes water he does not understand how cold air transforms a liquid into a solid. And 2.25.8 has it that knowing that one cassowary hatched from an egg laid by another is enough to know that one is the mother of the other even if we are (fortunately, one

the causal mechanisms involved is explicitly built into Locke's chapter "Of Cause and Effect": "For to have the idea of cause and effect, it suffices to consider any simple idea or substance, as beginning to exist, by the operation of some other, *without knowing the manner of that operation.*"³⁰

Recall from above Locke's reasons for thinking our knowledge is so limited. His claim was that God gave us our cognitive faculties not so that we could discover truth, but rather so that we could lead comfortable lives on earth whilst growing to love God and to gain salvation in heaven. As we have seen in the previous paragraphs Locke thinks our knowledge of the natural world is limited. But Locke's comments on *why* we should investigate the natural world are telling. Locke is explicit that natural philosophical investigations will never yield *scientia*, instead he thinks they are valuable because they can provide us with material comforts.³¹ Moreover, there are soteriological benefits that accrue from the study of nature.³² So Locke's views about the importance of studying the natural world are in keeping with both his general epistemic humility and his views about the proper functions of our cognitive faculties.

4.2 Injunction to Recognize these Limits

imagines) ignorant of the specifics of cassowary reproduction. Perhaps most striking is Locke's claim that we do not even understand one of the most basic causal processes, transfer of motion by impulse: 2.23.28.

³⁰ 2.26.2. Emphasis added. Locke's commitment to this view comes as early as the 1671 Draft A of the *Essay*. Consider Draft A §15: "I see when I apply fire to gold it melts it; a load stone neare iron it moves it, that snow & salt put into a vessell of water in the inside hardens the water that touches it on the outside: but in many nay most of these I have noe knowledge of the *modus operandi*, the way how these effects are produced..." Locke 1990, pages 30-31.

³¹ 4.12.10: "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." See also 2.23.12.

³² 4.12.12: "I readily agree the contemplation of his works gives us occasion to admire, revere, and glorify their Author." 2.23.12: "We have insight enough into [natural objects'] admirable Contrivances, and wonderful Effects, to admire, and magnify the Wisdom, Power, and Goodness of their Author."

The second component of Lockean humility is the idea that we err greatly when we attempt to extend our knowledge beyond its severe limits. I think this component of Lockean humility is less well-known and is sometimes underappreciated. So it will be worth reviewing his statements on the matter.

Locke's hope is that the *Essay* will enable us to realize when we are above our epistemic pay-grade. Here is a quote that nicely summarizes this position:

If by this Enquiry into the Nature of the Understanding, I can discover the Powers thereof; *how far* they reach; to what things they are in any Degree proportionate; and where they fail us, I suppose it may be of use, to prevail with the busy Mind of Man, to be more cautious in meddling with things exceeding its Comprehension; to stop, when it is at the utmost Extent of its Tether; and to sit down in a quiet Ignorance of those Things, which, upon Examination, are found to be beyond the reach of our Capacities.³³

Having the limits to our knowledge demonstrated so clearly is supposed to serve as a sort of therapy. It is supposed to help us realize that there are certain questions which we are unable to answer. Recognizing and accepting this will both let us avoid unseizable disputes and will force us to focus our efforts on the things that we are capable of (leading moral lives, for example). It will allow people to “employ their Thoughts and Discourse, with more Advantage and Satisfaction.”³⁴

Philosophers are particularly guilty of failing to recognize their epistemic limits. Locke thinks many philosophical disputes of the past are the product of people overextending their intellects: “Men, extending their Enquiries beyond their Capacities, and letting their Thoughts wander into those depths, where they can find no sure Footing; ‘tis no Wonder, that they raise Questions, and multiply disputes, which never comeing to any clear Resolution,

³³ 1.1.4.

³⁴ 1.1.7.

are proper only to continue and increase their Doubts....”³⁵ Locke’s thought is that the “perplexedness and difficulties”, the “wrangling”, and the “disputes”³⁶ endemic to philosophy are a product of our arrogance. Philosophers assume that answers are available to them in areas where they are manifestly unavailable. Things go better for us when we recognize our limits.³⁷

Finally, Locke enjoins us to recognize our cognitive limits because he wants us to recognize that while we do not have as much knowledge as we *want*, we have as much as we *need*. We have *enough* knowledge. Here is Locke’s description of the situation: “’Tis of great use to the Sailor to know the length of his Line, though he cannot with it fathom all the depths of the Ocean. ’Tis well he knows, that it is long enough to reach the bottom, at such Places, as are necessary to direct his Voyage . . . Our Business here is not to know all things, but those which concern our Conduct.”³⁸ So the news that there are strict limits to our knowledge is in no way *bad* news. Indeed, we can have no possible reason for complaint or dissatisfaction with regard to our epistemic position. Rather, we should rejoice in the abilities we do have. Locke offers us a metaphor in this respect: “If we will disbelieve every thing, because we cannot certainly know all things; we shall do much-what as wisely as he, who would not use his Legs, but sit still and perish, because he had no Wings to fly.”³⁹

³⁵ 1.1.7.

³⁶ See 2.23.32, 3.10.8, and 4.3.22 respectively. Each of the passages makes substantially the same point.

³⁷ I take it that getting rid of these “useless” philosophical debates is a part of the ground clearing and rubbish removal that Locke intended in his role as underlaborer to the great minds of his generation. See *Epistle to the Reader*.

³⁸ 1.1.6.

³⁹ 1.1.5. And just before: “It will be no Excuse to an idle and untoward Servant, who would not attend his Business by Candle-light, to plead that he had not broad Sun-shine.”

4.3 A Specific Argument

One of Locke's arguments about our ignorance is especially relevant for our current purposes. An early formulation of the argument comes from his notebooks and goes as follows:

In questions where there are arguments on both sides one positive proof is to be preponderate to a great many negatives, because a positive proofe is always founded upon some reall existence which we know & apprehend, whereas the negative arguments terminate generally in nothing; in our not ~~cannot~~ being able to conceive, & soe may be nothing but conclusions from our ignorance or incapacity & not from the truth of things w[hi]c[h] may & we have experience do really exist though they exceed our comprehension.⁴⁰

There are two things in this passage which deserve special mention. The first is the general sense of the passage. Locke is cautioning us against arguing from ignorance. He is saying that when we have no positive ideas on which to build our theories or arguments we should be careful not to make assumptions or jump to conclusions. Put differently, we need to recognize and respect the limits to our knowledge. The second thing to notice is Locke's clear admission that we can know that certain facts are true but fail to understand those facts and fail to understand how and why they are true. That is the lesson I take to be contained in Locke's claim about "the truth of things" which "we have experience do really exist though they exceed our comprehension." This will be salient later when we consider some specific phenomena.

The passage quoted above is from a journal Locke kept in 1677. So he formulated this argument at a relatively early stage of his philosophical development. Importantly, there is evidence that he continued to endorse this argument up through the period of the *Essay*'s

⁴⁰ Ms. Locke f. 2, page 55.

publication. Specifically, this argument plays a key role in a short polemical work that Locke wrote against Malebranche. Its presence in this work, which was composed in the early 1690's, shows that Locke continued to be skeptical about arguments that relied on our inability to conceive something. Indeed, his comments on Malebranche here seem to be a direct application of the general argument to a specific instance:

This I observe at the entrance, that P. Malebranche having enumerated, and in the following chapters showed the difficulties of the other ways, whereby he thinks human understanding may be attempted to be explained, and how insufficient they are to give a satisfactory account of the ideas we have, erects this of "seeing all things in God" upon their ruin, as the true, because it is impossible to find a better. Which argument, so far being only "argumentum ad ignorantiam," loses all its force as soon as we consider the weakness of our minds, and the narrowness of our capacities, and have but humility enough to allow, that there may be many things which we cannot fully comprehend, and that God is not bound in all he does to subject his ways of operation to the scrutiny of our thoughts, and confine himself to do nothing but what we must comprehend.⁴¹

⁴¹ *Examination of Malebranche*, §2. Locke 1823, volume 9, pages 211-212. Compare with §8 (pages 214-215): "In the close of this chapter he enumerates the several ways whereby he thinks we come by ideas, and compares them severally with his own way. Which how much more intelligible it is than either of those, the following chapters will show; to which I shall proceed, when I have observed that it seems a bold determination, when he says, that it must be one of these ways, and we can see objects no other. Which assertion must be built on this good opinion of our capacities, that God cannot make the creatures operate, but in ways conceivable to us. That we cannot discourse and reason about them farther than we conceive, is a great truth: and it would be well if we would not, but would ingenuously own the shortness of our sight where we do not see. To say there can be no other, because we conceive no other, does not, I confess, much instruct. And if I should say, that it is possible God has made our souls so, and so united them to our bodies, that, upon certain motions made in our bodies by external objects, the soul should have such or such perceptions or ideas, though in a way inconceivable to us; this perhaps would appear as true and as instructive a proposition as what is so positively laid down." There is a brief formulation of the argument at 4.10.19, and 4.17.20 is also relevant here. Finally, Locke offers substantially the same argument to the English Malebranchean, John Norris: "But we do not know how, by any natural operation, this can produce an idea in the mind; and therefore (a good conclusion!) God, the author of nature, cannot this way produce it. As if it were impossible for the Almighty to produce any thing, but by ways we must conceive, and are able to comprehend; when he that is best satisfied of his omniscient understanding, and knows so well how God perceives, and man thinks, cannot explain the cohesion of parts in the lowest degree of created beings, unorganised bodies." *Remarks on Norris*, §3. Locke 1823, volume 10, page 250. See Schuurman 2008 for a more thorough discussion of these passages and their context as well as an interpretation amenable to my arguments in this chapter.

Again both important aspects of the argument are present. First, we should be very careful when pronouncing on topics which we do not conceive clearly. Perception, the specific manner in which ideas are produced in us, is one of these topics. We need to admit that there are limits to our knowledge in this arena and have some humility. The second aspect of the argument is also present. There are processes and events in nature that exceed our comprehension. Here, unlike in the 1677 presentation of the argument, we learn more about Locke's reason for thinking that reality outstrips our understandings. The reason has to do with God's power. God is under no obligation to make nature intelligible to us; so it is unsurprising if it is unintelligible to us.

Part of the reason that Locke makes it clear we should avoid these 'arguments from ignorance' has to do with our natural tendencies. Locke recognizes that we have a natural tendency to look for explanations and that it can be quite difficult for us to accept that sometimes they are not available. As a result, Locke thinks that we are sometimes liable to posit inadequate or uncertain explanations and take them for truth. This comes out most clearly at 4.12.13 where Locke discusses the role that hypotheses should play in our thinking about natural phenomena. In this passage Locke says that we need to be extremely careful that we do not "take up any one too hastily." Part of the reason for this is that "the Mind, that would always penetrate into the Causes of Things, and have Principles to rest on, is very apt to do [so]."⁴² The errors we are prone to given our natural tendencies are the reason he stresses the importance of avoiding negative arguments.

⁴² 4.12.13. Compare with a passage from *De Arte Medica*, an early manuscript by Locke, in which he discusses earlier medical practitioners who "are not to be blamed that they did that wch is very [naturall to man] agreeable to the nature of [h]mans understanding, wch not contenting it self to observe the operac[i]on of nature & the event of things, is very inquisitive after their cause & [is] very restlesse & unquiet till in those things wch it is conversant about, it has framed to it self some hypothesis & laid a foundation whereon to establish all its reasonings." Transcribed in Walmsley 1998, page 234. Later in this manuscript Locke gives yet another

5. The Agnostic Response

In the prior section I argued that Locke embraced a certain form of epistemic humility. I now want to show how that humility pertains to the question about superaddition. My position is that it clearly entails the view that Locke neither affirmed nor denied the existence of non-natural properties in bodies. First I will discuss the question in the abstract. Then I will consider both of the specific cases (gravitation and thinking matter) to show that Locke's statements support the agnosticism I am attributing to him.

5.1 Superaddition in the Abstract

The question about superaddition can be formulated in several different ways, so there are a few avenues of approach. I will consider three approaches in turn.

One way to understand the question about superaddition is as a question about real essences. According to this formulation the question is something like this: "Do all of an object's properties flow from its real essence? Or are there some (superadded) properties or powers which God added to objects and which are unrelated to their real essences?"⁴³ My

version of his argument about humility in the face of God's omnipotence: "...but proud man, not content with that knowledg he was capable of & was useful to him, would needs [prie] *penetrate* into the hidden causes of things lay downe principles & establish maximes to him self about the operac[i]ons of nature, & then vainely expect, that Nature or in truth god him self should proceede according to those laws his maximes had prescribed him. whereas his narrow weake facultys could reach noe farther then the observac[i]on & memory of some few effects produced by visible & externall causes but in away utterly out of the reach of his apprehension, it being perhaps noe absurdity to thinke that this great [...] & curious fabrique of the world the workemanship of the almighty cannot be perfectly [understood by any thing els] comprehended by any understandg but his that made it..." The passage continues on this vein. Transcribed in Walmsely 1998, page 236.

⁴³ Ayers has suggested that when formulated in this way the question is nonsensical or trivially obvious. His argument is that Locke is employing the Aristotelian meaning of "property" in which properties (*propria*), by contrast to accidents, are "proper" to an object. On this view, all properties follow from an object's essence, so the idea of a non-natural property is incoherent. See Ayers 1981, pages 226-9. See also Jacovides 2002, section 2.3. It seems to me that Ayers has made far too much of this linguistic point and that we can allow ourselves a looser sense of the word "property". After all, Locke is hardly a Schiebler or a Sanderson (let alone a Scotus or a Suarez). Recall Locke's apology for his use of the word "idea": "I have used it to express whatever is meant by *Phantasm, Notion, or Species...*" (1.1.8) Someone willing to run together three things as

contention is that when the question is formulated like this Locke's response will be that it is unanswerable. Real essences are both unknown and, in principle, unknowable for us. So how would it ever be possible to discern which properties they are responsible for? As Locke writes: "What is the uttermost power of natural agents or created beings, men of the greatest reach cannot discover..."⁴⁴ A return to the clock analogy should help to make this clear. Imagine standing in front of a clock and considering two of the clocks' phenomena: 1) the movement of the hands around the face and 2) the chiming of the hours. Now consider two explanatory possibilities: a) the same mechanism (the real essence of the clock) that is responsible for 1) is also responsible for 2) and b) the mechanism that produces 2) is unrelated to the mechanism that produces 1), 2) is the product of an independent power divinely annexed to the clock. Now admittedly, if we could crack into the clock's casing we might (though would not necessarily) be able to make some progress on this question. But Locke's position is that we never get access to the clock's inner workings, we can only proceed based on observations of the clock's exterior. Thus, we have no basis for asserting either a) or b). Our ignorance of real essences demands an agnostic response to the question of superaddition.

A second way to understand the question about superaddition is as being about processes in nature. Put this way, it is something like: "Are all processes in nature natural? Or are some supernatural? Are all the features of a causal interaction determined by the natural properties of the bodies interacting or might other (divine) actors be in play?" When

different as a phantasm, a notion, and a species clearly was not someone deeply concerned with the correct usage of Scholastic terminology. Furthermore, to establish Ayers' point, a thorough analysis of Locke's uses of "property", "essential property", and "accident" would be necessary. I am skeptical that such an analysis would confirm Ayers' point and, in any event, he has not provided one.

⁴⁴ A Discourse of Miracles. Locke 1823, volume 9, page 261.

formulated in this way Locke's response will again be agnostic. The reason is that we are unable to determine, for any given causal interaction, which bodies are responsible for producing the features of the interaction: "But how many other extrinsecal, and possibly very remote Bodies, do the Springs of those admirable Machines depend on, which are not vulgarly observed, or so much as thought on; and how many are there, which the severest Enquiry can never discover?"⁴⁵ The worry is something like this. Consider a magnet drawing iron filings across a table. One might, just from a consideration of the magnet and of iron, be tempted to think that the magnet's power to attract iron is something that the magnet's real essence cannot account for. One might be tempted to conclude that magnetism is a quasi-magical power divinely granted to the magnet. But perhaps, for all we know, the phenomenon of magnetic attraction is a causal process produced not just by the magnet and the iron but instead produced by the magnet, the iron, and the moons of Jupiter.⁴⁶ There is, according to Locke, simply no way to tell if the moons of Jupiter are causally contributing to the phenomenon of magnetism. Thus, we are unable to tell if magnetism is a non-natural property added to magnets by God or if it is a perfectly natural one arising from the interactions between real essences.

A third way to understand the question about superaddition is as a question about the manner in which God constructed the world: "How did God choose to organize creation? Did he locate all of a substance's powers in its nature or are there additional 'special' powers which he put into substances over and above their natures?" When framed like this Locke

⁴⁵ 4.6.11. The full passage is too long to be quoted in its entirety. But Locke does devote considerable time to developing this line of thought in the passage cited, so it is worth considering his point carefully.

⁴⁶ 4.6.11: "Things in this our Mansion, would put on quite another face, and cease to be what they are, if some one of the Stars, or great Bodies incomprehensibly remote from us, should cease to be, or move as it does."

will, once again, reject the question as unanswerable. The scope of our understanding is limited. These limits preclude an understanding of God's omniscience and his omnipotence. Further, God is under no special obligation to make nature intelligible to us (it is enough that he has given us the ability to navigate and survive in the material world).⁴⁷ As Locke puts it: "The omnipotent Creator advised not with us in the making of the world, and his ways are not the less excellent because they are past our finding out."⁴⁸ So it seems that however one approaches the problem of superaddition Locke has an epistemological doctrine which shows the question to be inappropriate in virtue of our limited epistemic position.

5.2 Gravitation

In the previous section I tried to demonstrate the manner in which Locke's epistemology demands an agnostic response to the question of superaddition, understood generally. In this section, I want to consider the topic of gravitation. The locus of discussion for this topic is Locke's response to Stillingfleet, so we can make these texts the center of our concern.⁴⁹ Recall the centerpiece of this discussion:

But I am since convinced by the judicious Mr. Newton's incomparable book, that it is too bold a presumption to limit God's power, in this point, by my

⁴⁷ This point, in particular, exposes one of the fault lines between the empiricist and rationalist conceptions of God and nature. Locke is not Leibniz, whose God must always act in accord with the Principle of Sufficient Reason thereby ensuring our ability to understand Creation.

⁴⁸ *Reply to Stillingfleet*. Locke 1823, volume 4, page 461.

⁴⁹ Some commentators have thought that §192 of *Some Thoughts Concerning Education* is also a critical text for understanding Locke's position on gravitation. I think there are decisive reasons for discounting the importance of this text. First, it is a document containing practical instructions for the education of children. It is not a treatise on philosophy, science, or theology. Second, Locke's position in this section seems to be in conflict with his later remarks on the cause of the Deluge and his support for William Whiston's theory. Third, and most importantly, clear exposition of the section is impossible. The passage contains so many scope ambiguities, imprecise wordings, and apparent contradictions that its value will be limited at best. That said, I do think the very general point Locke is gesturing at in Section §192 (children ought to be well-appraised of God's omnipotence lest they fall into false or dogmatic metaphysical beliefs) coheres neatly with the argument of this chapter.

narrow conceptions. The gravitation of matter towards matter, by ways inconceivable to me, is not only a demonstration that God can, if he pleases, put into bodies powers and ways of operation, above what can be derived from our idea of body, or can be explained by what we know of matter, but also an unquestionable and every where visible instance, that he has done so.⁵⁰

Previous commentators have argued over whether this passage commits Locke to non-natural properties. Some think the clear sense of the passage is that God has, in fact, added non-natural properties to matter. Others think that this addition of powers could have been completed in a naturalistic way. God could have given bodies the power to gravitate, and he could have done so by giving them a real essence from which gravitational powers flow. It seems clear, however, that there is nothing in this passage which could decide between the two positions.⁵¹

More important, though, is that this debate about the naturalness of gravitational powers seems to distract from Locke's goal in the passage. Locke's goal is to encourage the sort of epistemic humility that I outlined in Section 4. His claim is that in the earlier edition of the *Essay* he had assumed that matter would behave only in ways that he could clearly understand. Locke now realizes that this was mistaken; in fact, he realizes that he was making the exact mistake he accused Malebranche of. He was guilty of making man the measure of nature. Now Locke realizes that gravitation, despite being unintelligible to him, is part of the universe that God made. This same sentiment is expressed in Locke's *Elements of Natural Philosophy*: "...two bodies at a distance will put one another into motion by the force of attraction; which is inexplicable by us, though made evident to us by

⁵⁰ *Second Reply to Stillingfleet*. Locke 1823, volume 4, page 467-468.

⁵¹ As Stuart 1998, page 358 puts it: "This epistemological point...is compatible with the metaphysical claim that these phenomena arise from mechanical interactions. However, it is equally compatible with the metaphysical claim that [these powers are non-naturalistically superadded.]"

experience...”⁵² Again, Locke’s message is that there are things which are *evident* but nevertheless *inexplicable*.

So Locke’s comments on gravitation do not seem to support either the view that gravitation is natural or non-natural. Instead, they seek to highlight our epistemic limitations; they are part of Locke’s general epistemic humility. And given that one component of this epistemic humility is the injunction to refrain from speculation on topics we do not understand, it seems safe to assume that Locke did not have a position on the naturalness of gravitation.

5.3 Thinking Matter

The status of the debate over the naturalness of thinking matter closely mirrors the status of the debate over the naturalness of gravity. Some commentators argue that Locke believed matter could think naturalistically, others argue that only non-natural superadded properties could account for thought in matter. But both sides miss Locke’s main purpose in discussing the possibility of thinking matter. Locke’s purpose is to emphasize the weakness of our understandings and urge caution when arguing over the substantial basis of thought.

We can begin with some of the texts used by those who think Locke held that thought could be a natural property of a material body. In general, their strategy is to point to passages in which Locke claims that for matter to think it must be properly organized. The implication here is that matter on its own may be incapable of thought, but the right arrangement of corpuscles could produce thought. For example, at 4.3.6 Locke wonders whether “some Systems of Matter *fitly disposed*” could have a “power to perceive and think”

⁵² *Elements*, chapter 1. Locke 1823, volume 3, page 305.

(emphasis added). Or in his controversy with Stillingfleet: "...nor prove any thing against his having actually endued some parcels of matter, *so disposed as he thinks fit*, with a faculty of thinking..."⁵³ But, of course, it is open to proponents of non-natural superadded properties to counter that there is no necessary connection between the naturalness of thought and a certain organization of matter. God may only give the non-natural power of thought to bodies organized in a certain way, but this does not show that the organization is responsible for the property of thought. So these texts are indecisive.

Now let us turn to some of the texts used by those who think thought cannot be a natural property of a material body. Most of these texts occur in the Book IV proof of God's existence:

"But let us suppose Motion eternal too; yet Matter, *incogitative Matter* and Motion, whatever changes it might produce of Figure and Bulk, *could never produce Thought*."⁵⁴ Or, slightly later in the chapter: "For unthinking Particles of Matter, however put together, can have nothing thereby added to them, but a new relation of Position, which 'tis impossible should give thought and knowledge to them."⁵⁵ These texts seem to suggest that mere matter could never be the substantial basis for thought unless thought were a non-natural power superadded to matter by God. But those who reject non-natural properties in Locke can find passages in the chapter which point in the other direction. For example, 4.10.17 (the point in the chapter where Locke considers the issue most carefully) seems to suggest that mere

⁵³ *Reply to Stillingfleet*. Locke 1823, volume 4, page 466.

⁵⁴ 4.10.10.

⁵⁵ 4.10.16.

matter *could* think, it just would not display the wisdom or omniscience characteristic of God.⁵⁶ So these texts are also disputed.⁵⁷

My position is that Locke's texts do not settle this debate one way or the other. And I argue that the reason the texts are indecisive is that Locke was not committed to thinking matter being either natural or non-natural; Locke was agnostic on the issue. I now want to turn to the many texts which show that Locke's primary goal in discussing the possibility of thinking matter was highlighting the limits of our knowledge. Here are three quotes from contexts in which Locke is discussing thinking matter:

But it is farther urged, that we cannot conceive how matter can think. I grant it; but to argue from thence, that God therefore cannot give to matter a faculty of thinking, is to say God's omnipotency is limited to a narrow compass, because man's understanding is so; and brings down God's infinite power to the size of our capacities.⁵⁸

From whence you infer, that God cannot bestow on any parcel of matter (the nature of matter remaining) a faculty of thinking. If the rules of logic, since my days, be not changed, I may safely deny this consequence. For an argument that runs thus, "God does not, ergo, he cannot;" I was taught, when I came first to the university, would not hold.⁵⁹

I think it becomes the modesty of philosophy not to pronounce magisterially where we want that evidence that can produce knowledge; but also, that it is of use to us to discern how far our knowledge does reach; for the state we are at present in, not being that of vision, we must in many things content ourselves with faith and probability.⁶⁰

⁵⁶ See Ayers 1991, volume 2, chapter 14 for a different "naturalistic" interpretation of these passages and their context.

⁵⁷ See Bennett 2005 for a balanced discussion of the arguments relevant to this topic.

⁵⁸ *Reply to Stillingfleet*. Locke 1823, volume 4, page 461. Note that these three quotes are meant to be illustrative rather than exhaustive.

⁵⁹ *Reply to Stillingfleet*. Locke 1823, volume 4, page 469.

⁶⁰ 4.3.6. I think that all of 4.3.6 is making just this point.

Locke's primary goal in discussing the possibility of thinking matter is to stress our ignorance. God's omnipotency guarantees the possibility of thinking matter, even if our weak intellects guarantee its unintelligibility and guarantee our inability to discern whether thinking matter would be natural or non-natural.

6. Locke's Scientific Contemporaries

Before moving on to discuss other positions on superaddition available in the secondary literature I want to emphasize one attractive feature of the interpretation which I have provided above. The attractive feature is that if we understand Locke as agnostic on the question of superaddition then his position will very closely resemble the positions of natural philosophers whom Locke associated with and respected. In the case of gravitation Locke's position closely resembles that of Isaac Newton and in the case of thinking matter it closely resembles that of Thomas Willis (1621-1675).⁶¹

Locke's agnosticism about the ontology of gravitation very closely matches the attitude of humility taken up by the "incomparable Mr. Newton." Newton, in the General Scholium of the *Principia*, famously admits that he has not explained the cause of gravitational attractions. This is the specific topic about which he will feign no hypotheses. We know from some of Newton's other writings that he was desperately interested in the cause of gravitation and he did entertain a variety of different thoughts on the matter. Nevertheless, Newton never publicly owned any one hypothesis; his consistent public

⁶¹ Locke's scientific and personal relationship with Newton is well-known and well-documented. His relationship with Willis is less well-known. Locke attended some of Willis' lectures at Oxford, obtained lecture notes for some others, owned some of Willis' published works, and was a very close friend and associate of Richard Lower, Willis' personal assistant and medical partner. For details see Dewhurst 1980 and for the Willis works owned by Locke see Harrison and Laslett 1971, page 265.

position was that the matter required further investigation. This seems to closely track Locke's position as I have interpreted it above. So I take it as an advantage of my view that it puts Locke and Newton on the same wavelength.

Important to emphasize is the fact that Newton did not rule out a mechanistic explanation of gravitation. Although Newton, like Locke, did not see a clear mechanist explanation of gravity forthcoming, he was unwilling to argue from this to the claim that gravitation was a non-natural property or to the claim that mechanism was false or of limited explanatory value.⁶² The attitude is best summed up by Newton's famous defender, Samuel Clarke. In his fifth letter to Leibniz Clarke writes that "If this or any other learned author can explain [gravitation] by the laws of mechanism, he will not only not be contradicted, but will moreover have the abundant thanks of the learned world."⁶³ So the Newtonian attitude toward gravitation is rather clear.⁶⁴ Newton had not closed his mind to a mechanistic account of gravitation, had not closed his mind to a non-mechanistic natural explanation of gravitation, and had not closed his mind to an explanation in terms of quasi-miraculous divine intervention. I think that the exact same is true of Locke. So on the issue of gravitation, the position I have attributed to Locke seems to be in lock step with Newtonian thinking of the time. Interestingly, there is also a scientific parallel for my interpretation of Locke in the case of thinking matter.

⁶² This is reflected both in Newton's remarks to Bentley and in Newton's consideration of the (mechanist) æther hypothesis as an explanation of gravitation.

⁶³ Leibniz and Clarke 2000, page 86.

⁶⁴ I mean 'Newtonian' here to refer to the position of Newton, not to the position of later 18th century Newtonians. This is important because many of Newton's followers *were* willing to make assertions about the cause of gravity. Some of them adopted a mechanist æther theory and others adopted an occasionalist theory.

Locke's agnostic position on thinking matter closely parallels the position held by Thomas Willis. Willis was the Sedleian Professor of Natural Philosophy at Oxford and was known both as a famous physician and as an innovator in anatomy and physiology, especially the anatomy and physiology of the brain. Our concern is with Willis' 1672 work *De Anima Brutorum*, which discusses the cognitive abilities of non-human animals. Willis thought that these abilities could be accounted for without attributing an immaterial soul to animals.⁶⁵ He notes at the very outset that some might find it impossible to conceive how material souls could be responsible for perception or sensation:

But that some object, that the Soul of the Beast, because it perceives, or knows that it feels, [must] be immaterial, for that Matter seems to be incapable of Perception, that indeed, had been likely, if that Perception should pass beyond the limits of Material things; or higher, than what inspires them, which things are usually attributed to Natural Instinct, or Idiocracie or peculiar Temperances, that I may omit Sympathies and Antipathies. But who should be the Betrother? I profess the great God, as the only Work-man, so also as the first Mover, and auspiciously present, every where, was he not able to impress Strength, Powers, and Faculties to Matter, fitted to the offices of a Sensitive Life? The Pen in the hand of the Writer, Disputes, Intreats, gives Relations of things, and is in the midst between things past and things to come; and why should we not believe that greater things than any of these, may be done, when the Skill of the Deity is present?⁶⁶

Willis here seems to be taking a line similar to Locke's. He realizes some people will have difficulty understanding a corporeal soul. But he says that we should not consider this to be an objection to the possibility of corporeal souls because God has the power to bring such things about. Interestingly, however, Willis remains entirely silent on the *mechanism* which

⁶⁵ It is important to note that Willis discusses sensation in matter, not thought in matter. Willis thought that humans, unlike other animals, had an immaterial soul that was responsible for rational thought, but we can leave this detail aside.

⁶⁶ Willis 1971, unnumbered page in Preface.

God uses to actualize these material souls. He does not affirm that God arranges matter appropriately nor does he affirm that God adds something extra to matter. Instead, he is content to say that God is capable of impressing the powers on matter and he leaves it at that.

Willis, like Locke, is aware that there is much speculation on the topic of souls and thinking matter. An early section of his book explores the various opinions of ancient and modern writers on the topic. Willis' dismissal of these views is informative: "And whilst every one expounds so the Works of the Creation, according to the model of his Wit, they seem to say, That God is not able to make any thing beyond what Man is able to Conceive or Imagine."⁶⁷ Again, Willis and Locke share an outlook: we must not fall into the error of thinking that the limits of human conceivability are the same as the limits of metaphysical possibility.

7. Other Interpretations and Formulations

Recall the initial formulation of the problem of superaddition that I offered in Section 1: "Did Locke believe that some objects have non-natural properties? More specifically, did he believe that God gave some objects properties which were unrelated to their natures?" My thesis has been that Locke is agnostic on this question; Locke's position is that it is in principle unanswerable. So I am committed to the view that something has gone very wrong in the debate about superaddition; it is my view that the debate is somehow defective. One natural response to this might be to suggest that my initial formulation of the question of

⁶⁷ Willis 1971, page 3.

superaddition was not the right one.⁶⁸ My goal in this section is to explore this suggestion in light of other positions on the question of superaddition available in the secondary literature.

7.1 Mechanism vs. Real Essences

One starting place might be to note that I framed the question in terms of natures or real essences. Many have thought, however, that the central question in the debate is about mechanistic and non-mechanistic properties rather than natural and non-natural properties.⁶⁹ So one might contend that I have skewed the debate by using a framework not shared by other participants. I think that this is false. My reasoning is as follows. The debate framed in terms of mechanical vs. non-mechanical properties will just be a specific instance of a more general debate about natural vs. non-natural properties. As such, any conclusions reached about natural vs. non-natural properties will follow *a fortiori* for mechanical vs. non-mechanical properties.

So nothing important to the argument of this chapter hinges on the use of real essences instead of mechanism to frame the question.⁷⁰ All of the arguments in the above sections will hold regardless of whether one thinks Locke was or was not committed to mechanism. Anyone who is so inclined is free to replace instances of “real essence” in this chapter with “micro-physical corpuscular substructure” and it seems to me that the substance of the argument will be untouched. Because we do not know the corpuscular substructure of

⁶⁸ I do not mean to deny that my formulation differs from many others in the literature. As will become clear in this section I am sensitive to other possible formulations. That said, it is worth noting that my formulation is not entirely unique; it closely resembles that of Langton 2000.

⁶⁹ Certainly it was a concern with “the limits of Boylean mechanism” that inspired Wilson 1979, the seminal article on this topic. And mechanism seems to be at the heart of other prominent treatments: for example, Ayers 1981, Lennon 1994, and Stuart 1998.

⁷⁰ Ayers 1981, page 222 seems to see this and Wilson 1982, pages 250-251 does as well.

objects we are unable to determine both a) which properties do, in fact, flow from them and b) what kinds of properties can, in principle, flow from them. So those who have set the question up as a question about mechanical properties have done nothing other than substitute in a preferred reading of Locke on real essences.

One might wonder, however, if the same conclusion to the debate comes about whether it is framed in terms of mechanical or natural properties, why I have opted for the latter given that other commentators have opted for the former. Is there any reason to prefer the latter? I think there is. The reason is that it allows us to remain neutral on what is a very difficult and very controversial topic in Locke studies, namely the status of mechanism in Locke's thought. My position is that using evidence about Locke's commitment (or lack thereof) to mechanism to settle the debate about superaddition is a dubious enterprise. It is *because* the question of Locke's relationship to mechanism is still an open one that I think it is important to divorce the question of mechanism from the question of superaddition.⁷¹ I take it as an advantage of my view that it does not depend on any particular view about Locke's position on the mechanist hypothesis.

Formulating the question about superaddition in terms of mechanical properties rather than natural properties is also to be avoided because it blinds us to the possibility that Locke accepted non-mechanistic natural properties.⁷² It is not my goal here to argue that Locke

⁷¹ So I am in agreement with Rozemond and Yaffe when they claim that the debate is not about mechanism but is instead about "in-principle-possibility of demonstration from real essences." Rozemond and Yaffe 2004, page 402.

⁷² This possibility is important given recent arguments by Stuart. Stuart 1998, page 352 claims that "Locke was never seriously committed to mechanism in the first place" and therefore the question about superadded properties is easily settled in favor of Locke being committed to non-natural properties. The possibility, for Locke, of non-mechanical natural properties shows how Stuart's argument goes wrong. The discussion in Downing 2007, sections 6-8 is extremely helpful on this point. Bolton 1998 is also notable for recognizing this possibility.

accepted vitalist or other types of non-mechanistic natural properties.⁷³ My goal is the more limited one of suggesting that they were at least a conceptual possibility for Locke.⁷⁴

Seventeenth century British thought offered a variety of popular non-Aristotelian vitalist theories (for example, Margaret Cavendish's or Francis Glisson's).⁷⁵ Important to note is that these theories were particularly prominent in the medical and life sciences, arenas of thought in which Locke took a special interest.

7.2 Metaphysics vs. Explanations and Intelligibility

Another objection to my initial formulation of the problem is that I framed the question in terms of the structure of bodies. Do all of an object's properties flow from its essence or are some artificially added on by God? Some, however, might suggest that it is wrong to organize the debate around metaphysical questions. Instead, the debate should focus on questions about the special intelligibility of mechanical properties.⁷⁶ On this view the question should be formulated as follows: "Are all natural phenomena understandable in terms of the mechanist hypothesis? Or are some not susceptible to mechanistic explanation and therefore non-naturally superadded?" I think that this way of framing the question has some serious shortcomings.

⁷³ I think that the question of whether or not he did, like the question about whether or not he accepted the mechanist hypothesis, is an extremely difficult question. And, I think these questions have to be indexed to various stages of Locke's intellectual development.

⁷⁴ And indeed, when one looks at Locke's introduction of the concept of a real essence at 2.31.6 he uses the term to refer to whatever internal constitution of an object is thought to give rise to its observable properties. He does not confine the use of the term to corpuscular sub-structures.

⁷⁵ For Locke's exposure to Glisson see Rogers 2008, note 32.

⁷⁶ Rozemond and Yaffe 2004, in particular, take this route.

One place to begin might be to note a distinction between what is mechanistically intelligible to us given our current epistemic state and what is in-principle mechanistically intelligible. If our concern is with the former then there will be very little to debate. Locke clearly believed that mechanism had a special intelligible status for us. And Locke clearly believed that there were limits to the intelligibility of mechanism.⁷⁷ So, if the debate about whether there are superadded properties is just a debate about what sort of phenomena are, at present, intelligible to us then there should be no disagreement.

If our concern is with the in-principle intelligibility, however, the debate reopens. Some might argue that all phenomena (including gravitation and thinking matter) are in-principle intelligible as mechanical phenomena. It is only our current epistemic limitations which prevent us from understanding how these phenomena are produced mechanistically. Others, however, might argue that no matter what epistemic position we are in there can never be a mechanical explanation of gravitation or thinking matter; they are necessarily non-mechanistic phenomena. My hope is that the arguments in this chapter are sufficient to show that Locke thought that neither of these positions is correct. If the debate is about whether mechanistic explanations of all phenomena are in principle available I think Lockean humility demands an agnostic answer.

So it seems to me that an emphasis on the special intelligibility of mechanism will not go very far toward a better approach to questions about superaddition. Before leaving the topic, however, I think there are two questions which are worth addressing. 1) Does the

⁷⁷ See Downing 1998, especially Section 3, for a good discussion of this special intelligible status and its limits. In this paper Downing declines to discuss superaddition in detail (page 409: What superaddition amounts to for Locke and how God is supposed to accomplish it is a perplexing question which we can, fortunately, skirt"). Nevertheless, I think that the arguments I have presented in this chapter are, in large part, amenable to the position she develops there.

special intelligibility status of mechanism have any impact on our understanding of scientific phenomena? 2) Why did Locke think mechanism had a special intelligibility status? I will consider these questions in order.

Should the special intelligibility of mechanism determine how we think about the metaphysics of material objects and their causal interactions with other objects? I think those who want to organize the superaddition debate around questions of intelligibility must answer yes to this question. Further, I think it is easy to see why they would want to do so. A very natural thought is that if mechanism is particularly intelligible to us we have very good reason for thinking that the world is organized mechanistically. And if the world is organized mechanistically then the existence of phenomena like gravitation and thinking matter are particularly troublesome. They do not cohere with our picture of how the world is organized and so we have reason to think that they come from non-natural superadded properties of bodies.

The problem with this line of thought is that it relies on an inference to best explanation (IBE). The line of argument says that because mechanism is intelligible to us, and more intelligible than any other scientific view, we have reason to think that the world is mechanistic.⁷⁸ Whatever the status of IBE arguments in contemporary philosophy, a major goal of this chapter has been to show that IBE is an invalid form of argument for Locke. For Locke, there is a major gap between intelligibility and the world (or, put differently, between intelligibility and either possibility or actuality). God, when making the world, did not have human intelligibility in mind. So whether or not something is intelligible to us does not bear on the question of what that thing is like (how it was made by God).

⁷⁸ This argument is presented explicitly in Halabi 2005.

What should we infer from the fact that various phenomena are unintelligible to us? Clearly we have no warrant for assuming that these phenomena are, in fact, *compatible* with the intelligible mechanistic hypothesis. Equally clear, however, is the fact that we have no reason for dogmatically asserting that they are *incompatible* with the mechanistic hypothesis and therefore non-naturally superadded by God. The only appropriately humble lesson to draw from the unintelligibility of certain phenomena is that we do not know how those phenomena are produced.

Recall the second interesting question about the special intelligibility of the mechanist hypothesis: Why did Locke think mechanism had a special intelligibility status? What sets mechanism apart from other theories? Now, once we understand that the intelligibility of mechanism is irrelevant to the question about superaddition (once we answer the first question) this second question might lose some of its interest. The answer to this second question will not affect our views about superaddition. Nevertheless, it is worth noting that the arguments given in this chapter might offer us some insight into why Locke thought mechanism was particularly intelligible.

The mechanist hypothesis, in its 17th century manifestation, was designed by analogy to the observable mechanical properties of ordinary objects. The operations of micro-level corpuscles were explained through this explicit analogy to the operations of macro-level objects. Recall from above Locke's account of the proper function of our faculties (including our intellect). Their foremost purpose was allowing us to survive in the material world: not getting bitten by tigers, cutting the skins off fruit to eat the insides, taking cover when it rains, etc. According to Locke we were specifically designed to understand medium-sized dry goods and how to manipulate them. Given this, I think we can establish two things.

First, it is not at all surprising that the mechanist hypothesis, because designed to be analogous to macro-level objects, is highly intelligible to us. Second, while our best shot at *conceptualizing* what the micro-level is like might be to understand it mechanistically this will not help us *know the nature of* the micro-level. So I think there is no reason to frame the debate about superaddition in terms of the intelligibility of mechanism instead of framing it in terms of natural vs. non-natural properties.

8. Conclusion

The goal of this chapter has been to argue that Locke was agnostic on the question of superaddition. Locke held that there were severe epistemic limits to our knowledge of the natural world. As a result of this, we are simply unable to tell which properties of bodies are natural and which are non-natural. The arguments in this chapter also show that no matter how we formulate the problem of superaddition any debate on the topic will be defective. Again, Lockean humility demands agnosticism.

Perhaps we should be disappointed with Locke's agnostic response to the question of superaddition. It is, after all, the "easy" way out of a fascinating and difficult problem. But perhaps Locke's agnostic response is also fitting. The *Essay* is a work of epistemology, not a work of metaphysics. Or, to put the point more clearly, the *Essay* is a book about *us*, about the human understanding, and not a book about the world and its contents. As such, it is only fitting that Locke confined himself within the limits of his subject matter.

5. Locke and the Laws of Nature

It is not enough to say that God has made a general law, for besides the decree there is also necessary a natural means of carrying it out... The laws of nature are not so arbitrary and so indifferent as many people imagine.

- G.W. Leibniz¹

1. Introduction

Laws of nature played an important role in natural-philosophical theory and practice during the seventeenth century. But seventeenth century philosophers and natural philosophers disagreed amongst themselves about what these laws were and how, or whether, they operated. The goal of this chapter is to clarify Locke's position with respect to the laws of nature. The overall argument has two parts. First, I present negative arguments to the effect that Locke did not believe that the laws of nature played an integral role in the production of natural phenomena. Second, I present positive arguments to the effect that Locke understood the laws of nature as inductive generalizations.

2. Motivation

¹ *Clarification of Bayle's Difficulties*. Leibniz 1956, volume 2, page 803.

One reason that Locke's views on the laws of nature are important is that laws of nature may be a central metaphysical category in Locke's thought. More specifically, laws of nature might play a role in what Locke calls "the natural operations of material bodies" or "the ordinary course of nature." Many commentators in the secondary literature have suggested that Locke understood the laws of nature as fundamental to the production of natural phenomena.² On this view the laws of nature are *prior* (both metaphysically and explanatorily) to phenomena. The laws help determine which phenomena are produced and how they are produced. And the laws are in some sense *causal* insofar as they are (at least partially) causally responsible for the actions of natural bodies.

On a related note, Locke's views on the laws of nature will also have important ramifications for how we understand Locke's views on explanation in natural philosophy and proper natural-philosophical methodology more generally. Many commentators claim that Locke believed that laws of nature play an important role in scientific explanation. I think it follows, *a fortiori*, that the commentators discussed in the previous paragraph embrace this position. But many others have also endorsed the view that Locke thought nomological explanations were an important component of scientific explanation.³

A final piece of motivation comes from noticing that laws of nature are a central topic in early modern philosophy.⁴ They play a role in the thought of Descartes, Malebranche, Spinoza, Leibniz, Newton, Berkeley, and no doubt many others. Given that Locke is an

² McCann 1985, McCann 1994 (especially pages 67-76), Stuart 1998, Langton 2000. See also Moyal 1985, page 113 and Stuart 1996, pages 463-464.

³ Buchdahl 1969, especially Section 4.7; Woolhouse 1971, especially Chapter 1; Rogers 1999, page 47; Chibeni 2005, especially Section 6. Woolhouse even goes so far as to describe laws of nature as "perhaps Locke's major theme" (untitled Preface page).

⁴ For a broad overview of laws of nature in early modern philosophy (particularly the 17th century) see Steinle 1995 and Milton 1998.

important early modern philosopher there may be some intrinsic interest in examining his position on the topic.

3. Two Questions

I will start by examining the views of those who think that Locke understands the laws of nature as integral to the production of natural phenomena. I do not think that this is a tenable position. Later in this chapter we will consider the details of specific proposals in the secondary literature. But we should begin by thinking generally about how this view would work and what it would entail. Specifically, I think we should consider two important questions for the position that laws of nature help to produce natural phenomena:

Ontological Status Question: What, precisely, is the ontological status of the laws of nature?

Governance Question: How, precisely, are the laws of nature causally responsible for the production of natural phenomena?

The first question asks what laws of nature are. The second asks what they do. I contend that when we examine both the logical space available in seventeenth century thought and Locke's other commitments it will be extremely difficult to find good answers for these questions.

4. Ontological Status Question

In the 21st century many of us are comfortable with speaking about *matters-of-fact*, *propositions*, or *laws* as though they are fundamental components of reality. The early moderns were not. For them, all matters-of-fact, propositions, or truths needed, to use a contemporary term, truthmakers. They believed that things, especially things exercising causal force, had to either be or be grounded in substances. So the ontological status

question asks for a detailed account of the substantial metaphysics that undergirds the laws of nature.

4.1 Reification

One natural response to this need to provide laws with a metaphysical basis would be reification. This was, broadly speaking, the strategy employed by some of Locke's predecessors. Henry More invoked a *hylarchic principle* and Ralph Cudworth appealed to a *plastick nature* to do the work of the laws of nature.⁵ Here is one of More's descriptions of this entity:

A substance incorporeal, but without Sense and Animadversion, pervading the whole Matter of the Universe, and exercising a plastical power therein according to the sundry predispositions and occasions in the parts it works upon, raising such Phaenomena in the World, by directing the parts of the Matter and their Motion...⁶

These were essentially substances which had the job of pushing matter around in set and regular ways. One might initially think that this position provides straightforward, though unparsimonious, answers to both the ontological status question and the governance question. Yet we know that Locke rejects this position.

⁵ A rather fascinating modification of this view appears in a work by Robert Clayton (1695-1758). See Clayton 1751 and Berman 1971.

⁶ *Immortality of the Soul*, Book 3, Chapter 12, Section 1. More 1987, page 254. Cudworth describes a plastic nature as "an Inferior and Subordinate Instrument, [which] doth Drudingly Execute that Part of his [God's] Providence, which consists in the Regular and Orderly Motion of Matter..." Cudworth 1678, page 150.

One of Locke's notebooks contains a list of comments he made while reading Cudworth's *True Intellectual System of the Universe*.⁷ In the midst of these comments Locke rejects the sort of view offered by More and Cudworth:

Thus because we cannot comprehend how a blinde jumble of Atoms can frame the curious bodys of animals nor yet thinke it fit to engage the immediate hand of god in the production of every mite & insect an anima mundi without knowledg & consciounesse is substituted as the conductr of ^physical^ generations & productions. But yet how this material ~~XX~~ unthinkeing soule (for if it be immaterial it will be yet harder to be understood) should be a better guide & artificer than unthinkeing matter or how it differs from it will be always equally hard to be explaind & soe in effect amounts to noe thing more but a new name of noething more intelligible than what we would explain by it JL⁸

Locke here uses the Platonist notion of an *anima mundi* to refer to the view held by Cudworth and More and emphatically rejects it. His reasons for rejecting it will become salient later. But for the moment it is worth mentioning that he was not alone in rejecting this view. Locke certainly would have been aware that his associate and sometimes collaborator, Robert Boyle, also found the view lacking.⁹

4.2 Divine Volitions

⁷ It may be important to note that these notes were made in the late 1680's. This was after Locke had met and befriended Damaris Masham, who was Cudworth's daughter.

⁸ Ms. Locke c.33, fol. 27. The fact that Locke appended his initials (JL) to this passage is significant. In his notebooks he often added this signature to lines of argument which were original to him or to which he was particularly attracted. Compare Locke's comment with Cudworth 1678, page 150: "Wherefore since neither all things are produced Fortuitously, or by the Unguided Mechanism of Matter, nor God himself may reasonably be thought to do all things Immediately and Miraculously; it may well be concluded, that there is a *Plastic Nature* under him..." Or with Cudworth 1678, page 147: "[it cannot be the case that] God himself doth all *Immediately*, and as it were with his own Hands, Form the Body of every Gnat and Fly, Insect and Mite, as of other Animals in Generations, all whose Members have so much of Contrivance in them..."

⁹ See, for example, Boyle 1999-2000, volume 10, pages 448-449 and 569 or volume 14, page 151 and 156-7. For more on Boyle's views on plastic natures see Greene 1962 and Henry 1990. For seventeenth century British rejections of plastic natures on different grounds see Cavendish 1664, page 215 and Hale 1677, chapter 3.

Another strategy for finding an ontological home for laws of nature would be to locate them in God. This was, broadly speaking, the strategy employed by another of Locke's contemporaries, namely Descartes.¹⁰ Ed McCann, Matthew Stuart, and Rae Langton all claim that, for Locke, laws of nature are just divine volitions.¹¹ This view seems *prima facie* promising. It seems to answer the ontological status question insofar as it gives the laws a substantial seat; divine volitions are not (really) distinct from God. And the view also seems to hint at an answer to the governance question; divine volitions are hooked up to an omnipotent divine will in a rather straightforward way. My claim, however, is that upon closer examination attributing this view to Locke raises some serious and difficult problems.¹²

My central concern with this strategy has to do with the *general* nature of laws. Laws are particular instances of the abstract form "All X's under such-and-such circumstances ϕ ." By their very nature, they are unificatory. Their explanatory force comes from the fact that they refer to a multiplicity of objects and phenomena. They are meant to govern objects insofar as those objects fall into a certain category. My claim is that this generality of laws of nature is inconsistent with their being divine volitions. The problem comes in two stages. First, there is the problem of how God could form general volitions. Second, there is the problem of what these general volitions would apply to. I will consider these in order.

¹⁰ *Principles*, part 2, sections 36-42. Descartes 1985, volume 1, pages 240-242. There is also a version of this view in Descartes' *Le Monde*. I have been unable to determine if Locke read this work. It was published in 1677 and is included in Locke's list of works in the "Cartesii Opera Omnia" which he owned (Ms. Locke b.3, folio 5). But it is not included in the list of his library. That said, his library does include a copy of G. Daniel's *Voilage du Monde de Des Cartes* (1691), a satire of Descartes' philosophy. See Harrison and Laslett 1971, pages 99-100.

¹¹ McCann 1985, page 216; Stuart 1998, pages 370-373; Langton 2000, pages 89-91.

¹² This view has previously been attacked in Jacobs and McNeish 1997. My criticisms differ from theirs.

The first difficulty with the view that laws of nature are divine volitions centers on the problem of how God could formulate such laws. Salient pieces of text come from Locke's *Remarks Upon Some of Mr. Norris's Books*. One issue which clearly exercised Locke in his reading of Norris was Norris' insistence that there are general ideas in the divine mind. At one point Locke gives a reference to Norris' "Reason and Religion, &c. Part II. Contem. II. §19, page 197." Here Norris argues as follows:

The same may be further confirm'd from the Perception of *Universals*. Which the mind could not well be supposed able to represent unless it saw *all* Beings included in *One*. For since every *Created* thing is an *Individual*, no one can say that he perceive any thing *Created*, when he perceives, suppose, a *Triangle* in *general*.¹³

In reacting to this view Locke says the following:

[According to Norris:] The perception of universals also proves that all beings are present to our minds; and that can only be by the presence of God, because all "created things are individuals". Are not all things that exist individuals? If so, then say not, all created, but all existing things are individuals; and if so, then the having any general idea proves not that we have all objects present to our minds. But this is for want of considering wherein universality consists; which is only in representation, abstracting from particulars.¹⁴

Locke is even more strenuously nominalist in replying to a different part of Norris' text. At one point he gives a reference to "Reason and Religion Part II. Contempl. II, §30, page 206."

Here, reproduced for context, is §30 in its entirety:

And this is what the Schools themselves must of necessity come to, if they would but attend to the consequence of what they affirm, when they say, That *Science is not of Singulars, but of Universal and Abstract Natures*. For where are these Universal Natures? Not in this *Ectypal World*. Whatever is here, is *Singular, this or that*, It must be therefore in the *Ideal* or *Archetypal World*,

¹³ Norris 1693, page 197.

¹⁴ Locke 1823, volume 10, page 250.

that is, in the Divine Nature, as exhibitiv as that which is created, where these Universal Natures, which are the proper objects of Science, are to be found. And consequently, 'tis in God that we know all the Truth, which we know.¹⁵

Here are two passages from the *Remarks* where Locke takes issue with Norris' claim:

It is "in the divine nature that these universal natures, which are the proper object of science, are to be found. And consequently it is in God that we know all the truth which we know". Doth any universal nature therefore exist? Or can any thing that exists any where or anyhow, be any other than singular?¹⁶

Whatever exists, whether in God, or out of God, is singular.¹⁷

What is going on in these passages? Well, a great number of things. But for our purposes Locke is making a point about particulars and generals. The upshot of his point is that there are no abstract natures; there are none on earth, there are none in a Platonic realm, and there are none in God's mind.¹⁸ I believe this shows that Locke's God does not form general volitions. Locke's God does not have an idea of the abstract nature "planet." Instead Locke's God just has ideas of Mercury, Venus, Mars, etc. But if this is the case then God does not have general volitions like "planets orbit in ellipses" which could stand as a laws.

More generally, Locke seems to just be making the reasonable point that a reliance on general principles or abstract ideas is something that only occurs in humans as a result of our

¹⁵ Norris 1693, page 206.

¹⁶ Locke 1823, volume 10, page 253.

¹⁷ Locke 1823, volume 10, page 257.

¹⁸ For what it is worth, the English Platonist camp agreed that this was a prime difference between their view and Locke's. And they gave as good as they got: "On Mr. Locke's system, the principles of science and sense are the same, for the energies of both originate from material forms, on which they are continually employed. Hence, science is subject to the flowing and perishable nature of particulars; and if body and its attributes were destroyed, would be nothing but a name. But on the system of Plato, they differ as much as delusion and reality; for here the vital, permanent, and lucid nature of ideas is the fountain of science..." Taylor 1788-1789, page xxxii. See the surrounding pages for Taylor's fuller and (though rather biased) quite interesting picture of the differences between Locke's system and his Platonism. And for more on this conflict see Wilson 1986.

finitude. We, in virtue of our inability to understand an infinite number of facts and other epistemic weaknesses, must rely on general ideas.¹⁹ But God would have no need of such things. Referring to our abstract idea of a triangle, Locke writes:

In effect, it is something imperfect...’Tis true, the Mind in this imperfect state, has need of such *Ideas*, and makes all the haste to them it can, for the conveniency of Communication, and Enlargement of Knowledge; to both which, it is naturally very much enclined. But yet one has reason to suspect such *Ideas* are marks of our Imperfection...²⁰

Some of Locke’s other remarks about divine and angelic cognition also support the claim that Locke’s God has no need of general thought or general volitions.²¹ I think that, at a minimum, we have reason to be very cautious about the view that, for Locke, laws of nature are divine volitions.

So the ontology of these laws of nature themselves will be complicated. I now want to suggest that this view of laws of nature has ontological implications which are also problematic. Put differently, I now want to ask what it is that the laws of nature are meant to range over. Again, I think that Locke’s nominalism will create problems. Recall that laws have a form like: “All X’s under such-and-such circumstances ϕ .” Setting aside the argument discussed just above, imagine that Locke’s God actually could form such general

¹⁹ A similar point is made in recent work on truth. Many disquotationalists offer human finitude as an explanation for why we have linguistic constructions involving truth even though truth does no substantive philosophical work. Saying “Smith said something true” saves us the impossible task of saying “Smith said ‘the cat is on the mat’ and the cat is on the mat or Smith said ‘ravens are black’ and ravens are black or Smith said ‘London is in England’ and London is in England....[ad infinitum]”.

²⁰ 4.7.9.

²¹ For example, *Examination of Malebranche*, §52. Locke 1823, volume 8, page 251: “I think we cannot say God reasons at all; for he has at once a view of all things. Or *Conduct of the Understanding*, §3. Locke 1996, page 9: “Here we may imagine a vast and almost infinite Advantage that Angels and separate spirits may have over us; who in their several degrees of Elevation above us, may be endowed with comprehensive Faculties, and some of them perhaps have perfect and exact Views of all finite Beings that come under their Consideration...” Thanks to Kathryn Tabb for pointing these passages out to me.

volitions. To what would these volitions apply? Well, seemingly they would apply to all the X's. The problem is that Locke does not believe that there are objective facts about the world which carve objects up into X's and non-X's. These sorts of taxonomic divisions, according to Locke, are contingent on our mental acts; they do not track mind-independent features of the world.²² So even if God did produce general volitions, it is not clear how they would map on to material objects in the world. Again, I think that we have reason to be cautious about this view and reason to think that spelling the view out in full detail will be very difficult.

4.3 Divine Volitions Amended

I can imagine two possible responses to the worries raised in the previous section. First, one might try to argue that Locke's God decrees highly conjunctive laws that do not invoke general terms. Second, one might try to restrict the scope of what the laws range over. I will discuss these two possibilities in turn.

First, one might argue that God can will laws without appealing to general terms. God could just will highly conjunctive laws.²³ For example, God, instead of willing that "planets move in ellipses" could will that "Mercury moves in an ellipse, and Venus moves in an ellipse, and Mars moves in an ellipse, and..."²⁴ One motivation for this strategy might be

²² Locke's clearest statement of this position comes at 3.6. One might object that surely Locke believes that categories like "mind" and "body" carve the world up into distinct natural kinds. But this will be difficult to square with many of Locke's remarks to Stillingfleet. There is also the further observation that "mind" and "body" are extremely abstract ideas; as such they will appear very high up on the Porphyrian tree of species and genus. And Locke is even more skeptical about natural groupings of genera than he is of natural groupings of species. See 3.6.32.

²³ Thanks to Jamin Asay and Kristin Primus for suggesting this line of thought to me.

²⁴ Of course ellipse is also a general kind, so some further precisification is needed. It would be incumbent on defenders of the view to provide the precise semantics of these laws.

that the “general law” and the “conjunctive law” would be empirically indistinguishable. They would have the same set of consequences in the created world.

But what is the sense in which this conjunctive volition would be a *law*? Would it really be one volition on God’s part, or would it instead be a vast number of distinct volitions? And if it is the later, what groups these distinct volitions together? There is also the pressing question of which creatures make it into the massive conjunction. On the basis of what does God decide that some things will behave in one way and some things will behave in another? Could this provide a basis for objective natural kinds in Locke? Until we have a fully worked-out account of this position I believe we have reason to be dubious about its prospects.

A second strategy for making the “laws as divine volition” strategy plausible would be to severely restrict the scope of the laws of nature. One might claim that Locke does not intend for there to be any laws which govern types. Instead, the laws are only meant to govern *matter*. On this view, there are no laws of nature which might be categorized as biological or chemical laws. Instead, the only true Lockean laws of nature are the fundamental laws of physics. More precisely, the only true Lockean laws of nature are the laws of mechanics which govern the transfer of motion between material objects.

One initial thing to notice about this restriction is that it will severely limit the role that laws could play in a larger picture of scientific explanation. Locke clearly thought that scientific explanation extended far beyond the fundamental laws of mechanics. Indeed, Locke seemed interested in (at least) medical, psychological, botanical, chemical, meteorological, geological, and biological types of explanation. And in many, if not all, of these realms Locke thought the search for law-like regularities played a critical role. So this

view will restrict the importance of laws of nature to one very small corner of natural philosophy and it will sit uneasily with Locke's claims about scientific methodology in the rest of natural philosophy.

The claim that the only laws of nature are the laws of pure mechanics will also face serious textual hurdles. At 2.23.28 Locke claims that we are in total ignorance of the mechanism by which matter transfers motion to other matter. On this topic Locke claims that we are "in the dark."²⁵ This passage will be very hard to reconcile with the claim that Locke embraces a view on which it is the laws themselves that are the intelligible mechanism that governs these processes. And at 4.3.29 Locke writes that "The Things that, as far as our Observation reaches, we constantly find to proceed regularly, we may conclude, do act by a Law set them; but yet by a Law, that we know not..." First, I think it will be hard to read this as a claim merely about material corpuscles, rather than as a more general claim. Locke thinks that corpuscles are unobservable, but the "things" governed by a law in this passage are observable. Second, if we restrict Lockean laws to just the laws of motion then his claim here that they are "unknown" to us will be very confusing. Surely Locke thinks that Newton has uncovered these laws in the *Principia* and we now know them as a result.

The most worrying thing about restricting the scope of the laws in this way, however, is that it makes the view responsible for providing answers to a number of seemingly intractable questions in Locke's theory of matter. Is solid extended substance the *real* essence of matter? Or is solid extended substance merely the *nominal* essence of matter?

²⁵ 2.23.28. 4.6.14 is also relevant to the point about our ignorance: "Before we can have tolerable knowledge of this kind, we must first know what changes the *primary Qualities* of one Body, do regularly produce in the *primary qualities of another*, **and how...** Which, I think, every body will allow, is utterly impossible to be know by us, without revelation." [Emphasis added.] Intriguingly, in the 2.23.28 passage Locke also hints at doubts about the universality of conservation laws. But perhaps he just has some primitive notion of collisions between elastic bodies in mind.

Does matter come in discrete atomic units? Or is matter infinitely divisible? If it comes in atomic units are they all the same? If yes, then are these units a natural kind?²⁶ If they are, then on the basis of what? If the fundamental units are not all the same then how do they differ? By size? By shape? Are those shapes mutable? Or do the divine volitions pertain to matter-as-a-whole?²⁷ If so, then how do those volitions explain particular material events? Perhaps it is possible to provide clearly worked-out, principled, and textually defensible responses to all of these questions.²⁸ And perhaps it is the case that those answers would make this view of laws of nature plausible. I am skeptical. But the important point here is not a philosophical one. Instead, it is a dialectical one. If we are to accept the view that Lockean laws of nature are divine volitions which range over matter then it is incumbent on the defenders of this view to provide us with answers to these questions. Until they do so the burden of proof lies with them.

To sum up the main points of this section, my central objection to the view that laws of nature are divine volitions is that it will be hard to reconcile this with Locke's nominalism. Locke's position that even in God there are no ideas of objective natures means that God will not be able to formulate general laws of nature as volitions. And Locke's position that there are no natural kinds means that there will be no proper class of objects to which the laws apply. But while I think the ontological status question is problematic, I do not think it is the

²⁶ Put differently, could God form a volition "All corpuscles in such-and-such circumstances ϕ " without the worries about nominalism resurfacing? Would not God's volition have to be "In such-and-such circumstances: Christine (this corpuscle) ϕ s and Connie (that corpuscle) ϕ s and Clarence (that other corpuscle) ϕ s, etc."?

²⁷ Locke seems to reject this possibility at 4.10.10: "Not to add, that though our general or specifick conception of Matter makes us speak of it as one thing, yet really all Matter is not one individual thing, neither is there any such thing existing as one material being or one single Body that we know or can conceive."

²⁸ For discussion of many of these issues and references to some relevant literature, see Woolhouse 2005.

most serious issue facing the view that the laws of nature contribute to the production of natural phenomena. I now want to turn to the governance question.

5. Governance Question

Recall the governance question from above: How, precisely, are the laws of nature causally responsible for the production of natural phenomena? For example, when one billiard ball moving at such-and-such a speed in such-and-such a direction collides with a second billiard ball and the second ball moves away at a determinate speed in a determinate direction what is the exact causal role being played by the laws of nature? Seventeenth century philosophers had no shortage of answers to the question of who the causal agents in this sort of scenario might be: the first billiard ball, the æther, the second billiard ball itself, God, created spirits, etc. My contention is that providing a fully-specified and coherent interpretation of Locke on which the laws of nature are one of the causal agents involved will prove very difficult.

5.1 The Threat of Occasionalism

One initial problem for the claim that laws are divine volitions *and* that they causally contribute to the production of phenomena is that the view seems to imply a form of occasionalism. If the laws of nature are responsible for the determinate motions of a particular billiard ball and if these laws of nature are divine volitions then it is hard to avoid the view that God himself is directly moving the second billiard ball around.

There is nothing *prima facie* wrong with this view. In fact, many of Descartes' followers (including, of course, Malebranche) were under the impression that there were very tight connections between occasionalism and the view that the laws of nature are divine

volitions. And occasionalism is highly attractive insofar as it provides a very clear answer to the governance question. The laws are efficacious insofar as they are divine volitions and the divine will is omnipotent. If God wanted a billiard ball to move in a certain speed and direction upon some specified occasion then certainly he could exercise his will and move it in that direction at that speed.

The problem with the occasionalist view is that Locke does not hold it.²⁹ Recall the passage from Locke's notebook where he agreed with Cudworth that we do not "thinke it fit to engage the immediate hand of god in the production of every mite & insect." He is more expansive on the topic in his *Remarks on Norris*. Consider the following two quotes:

The infinite eternal God is certainly the cause of all things, the fountain of all being and power. But, because all being was from him, can there be nothing but God himself? or, because all power was originally in him, can there be nothing of it communicated to his creatures? This is to set very narrow bounds to the power of God, and, by pretending to extend it, takes it away. For which (I beseech you, as we can comprehend) is the perfectest power; to make a machine, a watch, for example, that when the watchmaker has withdrawn his hands, shall go and strike by the fit contrivance of the parts; or else requires that whenever the hand, by pointing to the hours, minds him of it, he should strike twelve upon the bell?³⁰

[According to occasionalism,] A man cannot move his arm or his tongue; he has no power; only upon occasion, the man willing it, God moves it. The man wills, he doth something; or else God, upon the occasion of something, which he himself did before, produced this will, and this action in him. This is the hypothesis that clears doubts, and brings us at last to the religion of Hobbes and Spinoza, by resolving all, even the thoughts and will of men, into an irresistible fatal necessity. For, whether the original of it be from the continued motion of eternal all-doing matter, or from an omnipotent immaterial being, which, having begun matter and motion, continues it by the

²⁹ Certainly it would be remarkable if he did. And it would be even more remarkable if we discovered that he did in a roundabout way by examining his views on the laws of nature!

³⁰ *Remarks on Norris*, §15. Locke 1823, volume 10, page 255. Hume offers the same argument towards the end of Part 1 of Section 7 of his *Enquiry Concerning Human Understanding*.

direction of occasions which he himself has also made; as to religion and morality, it is just the same thing.³¹

So Locke certainly was unwilling to countenance occasionalism. He thinks that rather than glorify God the position either weakens our estimation of Him or, worse, has disastrous moral consequences.

Does Locke's rejection of occasionalism mean that he rejected the laws-as-divine-volitions view? Not necessarily, but it is worth noticing that many of Locke's contemporaries thought the connection between the two positions was very tight. As previously mentioned, many, if not most, of Descartes' followers saw the dialectic this way. And the situation was the same in England. Recall the positions of More and Cudworth discussed in Section 4.1. One of the motivations for their (quite silly) view was the desire to avoid occasionalism.³² They recognized that without some independent creature to do the work of the laws of nature God himself would have to do that work. The picture emerging for Locke is slightly different. He is unwilling to be an occasionalist but also rejects More and Cudworth's position.

So the governance question takes on a special force if one accepts the view that the laws of nature are divine commands. Specifically, it asks how occasionalism can be avoided. What would it be to have laws of nature which are causally efficacious and which are divine volitions but which do not involve God in the production of phenomena?³³

5.2 Brute Fact-Making

³¹ *Remarks on Norris*, §16. Locke 1823, volume 10, page 255-256.

³² See, for example, book 1, chapter 3, section 5 of Cudworth 1678. See also Cunning 2003.

³³ Here is a good point to note that there is a substantive debate over whether or not Boyle subscribed to some sort of occasionalism. I think a dialectic very similar to the one outlined in this chapter is responsible for, and represented in, that debate. See, for example, McGuire 1972 and Anstey 1999.

Those who argue that, for Locke, laws are causally efficacious and that they are divine volitions avoid the threat of occasionalism through what I will call “brute fact-making.” On this view God, in decreeing the laws, simply *makes it the case that* bodies behave in set ways. He does not do this by exercising his own continuous causal force and he does not do this by creating anything which exercises causal force. But nevertheless his volitions cause bodies to act in ways that are not fully determined by those bodies alone. Thus, the laws of nature operate as a matter of brute, inexplicable fact.

Langton explains this by saying that “it is possible that gold and aqua regia should have the primary qualities they actually have, and for gold to be insoluble in aqua regia. Had it been God’s good pleasure to decree different laws of nature, or none, things could have the same primary qualities and different causal powers.”³⁴ Stuart writes that “If Locke is a strong voluntarist, then he must hold that in order to establish the laws of motion, God does something over and above simply creating solid, extended substances and giving them an initial push.”³⁵ McCann writes that:

The law is arbitrary in that it is only one of a number of possible but mutually exclusive connections that might hold between types of constitution and resultant qualities, and that it is the one that does obtain is due only to the undetermined action of God. Nevertheless, the connection thus forged between the primary qualities of the body and the secondary qualities and other of its powers is a necessary connection, in Locke’s sense, since God is thought of here as decreeing a *law* connecting the qualities.³⁶

³⁴ Langton, page 89. The passage continues: “Adapting Locke’s isolation test yet again...put a piece of gold by itself, and this time really be itself, unaccompanied by other objects, and *unaccompanied by laws...*” Emphasis in original.

³⁵ Stuart, page 372. The passage continues: “God must decide what the extended, solid substances are going to do with that push, an outcome that is not completely determined by the essence of matter.”

³⁶ McCann 1985, page 216.

All three of these writers hold that *laws* determine which *powers* bodies have. They hold that in decreeing the laws of nature God makes it the case that bodies will act in set and determinate ways. To use McCann's language, the volition *forges a connection* between bodies and actions.

I find it tremendously difficult to attribute this position to Locke. Part of the reason is that I struggle to understand how, if at all, this position actually provides an answer to the governance question. The governance question asks how it is that the laws of nature help produce natural phenomena. The answer provided by Langton, Stuart, and McCann is that the laws determine the production of natural phenomena because they automatically guarantee that bodies will behave in a certain way. But this is not to answer the question at all. Or, if it is an answer, it just pushes the question back. *How* do the laws act to determine which phenomena will be produced? *How* do the laws guarantee that natural bodies will behave in a certain way? What is the *mechanism* by which these laws operate? Without clearer, non-metaphorical, answers to these questions it is hard to see how this view could offer an explanatorily satisfying model of the operations of nature. Given this lack of explanatory power it is hard to believe that Locke would have endorsed such a model.

One salient consideration is the fact that Locke had very high standards for explanation in this domain. Recall his frustration with the "plastick nature" model proposed by More and Cudworth. Locke's primary dissatisfaction with the model was that it lacked explanatory power; he thought that it failed to really make clear how it was that bodies act in set and predictable ways; that model "in effect amounts to noe thing more but a new name of noething more intelligible than what we would explain by it." Locke's critique of plastic

natures here seems to parallel his ridicule of dormitive virtue explanations in the *Essay*.³⁷

And it is hard to see how an appeal to laws decreed by God without the specification of any mechanism could avoid a similar dormitive virtue critique. Given Locke's insistence on clear and distinct ideas as the ideal of intelligibility it is hard to imagine that he would have been satisfied by loose talk of God "ensuring" certain outcomes or "forging" connections.³⁸

We should also consider two passages in which Locke refers to a laws of nature model. Both passages come from his *Examination of Malebranche* and both involve a comparison between a laws of nature model of vision and Malebranche's doctrine of vision in God:

This I can resolve only into the good pleasure of God, whose ways are past finding out. And, I think, I know it as well when I am told these are ideas that the motion of the animal spirits, by a law established by God, produces in me; as when I am told they are ideas I see in God. The ideas it is certain I have, and God both ways is the original cause of my having them; but the manner how I come by them, how it is that I perceive, I confess I understand not; though it be plain motion has to do in the producing of them...³⁹

Here is by the will of God given union and perception in both cases; but how that perception is made in both ways, seems to me equally incomprehensible. In one, God discovers ideas in himself to the soul united to him when he pleases; and in the other, he discovers ideas to the soul, or produces perception in the soul united to the body by motion, according to laws established by the good pleasure of his will; but how it is done in the one or the other, I confess my incapacity to comprehend. So that I agree perfectly with him in his conclusion, that "there is nothing but God that can enlighten us:" but a clear comprehension of the manner how he does it, I doubt I shall

³⁷ See 2.21.20.

³⁸ Consider, for example, 4.12.12: "All I would say, is, that we should not be too forwardly possessed with the opinion, or expectation of knowledge, where it is not to be had; or by ways that will not attain to it: *That we should not take doubtful systems for complete sciences, nor unintelligible notions for scientific demonstrations.*" Emphasis added.

³⁹ *Examination of Malebranche*, § 10. Locke 1823, volume 9, page 217.

not have, till I know a great deal more of him and myself, than in this state of darkness and ignorance our souls are capable of.⁴⁰

I take it that these two passages are making very similar points. Locke is reporting that, to his mind, the doctrine of vision in God and a laws of nature model have precisely the same amount of explanatory leverage: either none or very little. We know that Locke rejected the vision in God model (that is the whole point of the *Examination*), so why should we think he was more favorably disposed toward the laws of nature model? Instead, Locke seems to fall back on his highly characteristic agnosticism about the natural world. His official view seems to be that God organized the universe in a way that is beyond our comprehension.⁴¹

There is one other relevant piece of text. The laws of nature model proposed by McCann, Stuart, and Langton argues that objects themselves do not fully determine their actions. Instead, God, through his divine volitions, brutally and arbitrarily makes it the case that the bodies act in ways that He finds acceptable. But consider the following passage:

I offer this only as a subject of magnifying the admirable contrivance of the divine wisdom, in the whole work of our redemption, as far as we are able to trace it, by the footsteps which God hath made visible to human reason. For though it be as easy to omnipotent power to do all things by an immediate over-ruling will, and so to make any instruments work, even contrary to their nature, in subserviency to his ends; yet his wisdom is not usually at the expense of miracles, (if I may so say) but only in cases that require them, for the evidencing of some revelation or mission to be from him. He does constantly (unless where the confirmation of some truth requires it otherwise) bring about his purposes by means operating according to their natures. If it were not so, the course and evidence of things would be confounded, miracles

⁴⁰ *Examination of Malebranche*, § 42. Locke 1823, volume 9, pages 238-239.

⁴¹ One might object that it is psychophysical laws under discussion in these passages, rather than mere laws of nature. But, at 2.23.28 Locke makes an explicit comparison between our ignorance of psychophysical connections and of purely physical ones. So I think the difference is irrelevant. See also 4.6.14.

would lose their name and force, and there could be no distinction between natural and supernatural.⁴²

Here Locke grudgingly acknowledges that God can, if he wants, engage in brute fact-making. But Locke's point is that this is not God's *modus operandi*. Certainly God does not do this continually as a matter of course. Instead, Locke's God only engages in brute fact-making on special occasions for a particular purpose.

This concludes my arguments against the view that, for Locke, the laws of nature are, in some way, causally responsible for the production of natural phenomena. I do not take any of these arguments to be fully conclusive. Instead, I think that these arguments do two things. First, I think they should convince us that if we are to accept this view then much more expository work has to be done to make it precise, intelligible, and complete. Second, I think these arguments should leave us with a general dissatisfaction with this approach. In the next section I want to outline an approach which, I hope, is more promising.

6. The Lockean View of Laws

In the seventeenth century, the concept of a law of nature was only beginning to emerge. And the dominant approach to laws of nature was the realist one considered above. This approach gets a forceful presentation in Descartes and it is his view which provides the framework for thinking about laws of nature in much of the early modern period. That said, I think at the same time a different approach to laws of nature is also being formulated. Rather than explicate a metaphysics of laws, this approach seeks to find generalizations that hold true of observed phenomena. It is these generalizations which are considered laws of nature. This second approach is initially more nebulous than the Cartesian realist one and takes

⁴² *Reasonableness of Christianity*. Locke 1823, volume 7, pages 84-85.

longer to develop. Nevertheless, I think it clearly has roots in England and particularly in the work of early members of the Royal Society.

In this section of the chapter I want to argue that Locke is strongly inclined toward this second approach to laws of nature. The interpretation of Locke which I rejected in the previous two sections held that the laws are what ground or cause the activities of bodies. My interpretation holds the opposite; it is the activities of bodies which ground the laws of nature. For Locke, laws of nature are a way of recognizing and cataloging the various powers that bodies have. The phenomena are (explanatorily and metaphysically) prior to the laws.

One initial point to make is that on this understanding of laws of nature the ontological status and governance questions present no difficulties. The laws of nature on this view are mental constructs, mere generalizations made by human observers. They have the ontological status of human thoughts. The governance question does not even arise. On this view the laws of nature *describe* natural phenomena, they do not *produce* or *control* them.

6.1 Lockean Natural Philosophy

In this section I want to offer a brief sketch of Locke's views on methodology in natural philosophy. This will put us in position to see where the concept of laws might fit in his scheme. As is well known, Locke thought that the creation and publication of natural histories was a critical component of natural philosophy.⁴³ These natural histories were vast collections of observations and reports of experimental results. For the most part, however,

⁴³ For a recent overview of this see Anstey 2011, chapter 1.

Locke did not think the construction of these natural histories was a good in itself. Instead, Locke believed that these natural histories would help to provide the foundation for a more comprehensive understanding of the natural world.

The thought was that natural histories could provide an induction base for recognizing patterns, regularities, and more general truths about the natural world. Here is a passage in which Locke suggests that we should draw on natural histories to find these generalizations:

Particular matters of Fact are the undoubted Foundations on which our civil and natural Knowledge is built: The benefit the Understanding makes of them is to draw from them Conclusions, which may be as standing Rules of Knowledge and consequently of Practice. The Mind often makes not that Benefit it should of the information it receives from the accounts of Civil or Natural Historians, in being too forward, or too slow in making Observations on the particular Facts recorded in them.⁴⁴

My claim is that it is some of these general conclusions drawn from particulars that are Lockean laws of nature.

For example, as Lockean natural philosophers we might turn our efforts to chemistry. We could undertake an experimental program to discover which liquids are good at dissolving or breaking up mineral residue. We might also consult blacksmiths, tanners, housemaids, and the like.⁴⁵ Eventually we might have something like a natural history of

⁴⁴ *Of the Conduct of the Understanding*, §13. Locke 1993, page 48. On the next page Locke continues in this vein: "...those seem to do best who taking material and useful hints, sometimes from single matters of Fact, carry them in their Minds to be judg'd of, by what they shall find in History to confirm or reverse these imperfect Observations; which may be establish'd into Rules fit to be rely'd on, when they are justify'd by a sufficient and wary Induction of Particulars."

⁴⁵ Pierre Coste, in a report on Locke's character, claims that Locke very much enjoyed talking to and questioning skilled workers, and said the following: "And indeed, Mr. LOCKE had by this means acquired a very good insight into all the Arts, of which he daily learnt more and more. He us'd to say too, that the knowledge of the Arts contained more true Philosophy, than all those fine learned Hypotheses, which having no relation to the nature of things, are fit for nothing at bottom, but to make men lose their time in inventing, or comprehending them." Locke 1720, page ix. In context, it is clear that "arts" refers to practical skills like gardening, carpentry, or jewelry manufacture. This report seems to fit nicely with Locke's claim at 2.8.3 that "A Painter or Dyer, who never enquired into their causes, hath the *Ideas* of White and Black, and other Colours,

mineral residue removal. But this, on its own, might not be very useful. What would be helpful would be to review our natural history and note that liquids like vinegar, oil of vitriol (H_2SO_4), spirit of nitre (HNO_3), and other acids are good at removing mineral residue.⁴⁶ We would then be in a position to infer a generalization, namely, that acids remove mineral residue. And this sort of generalization would, I believe, serve as a Lockean law of nature.

6.2 Newton's Laws

There is a way of looking at Newton's methodology and the status of laws in Newton's system that might help us to flesh out the account outlined in the previous section.⁴⁷ Of course, the *Principia* begins with definitions and laws and then shows how they can be used to demonstrate various phenomena. At the outset, this might look very different from the view sketched above, on which one begins with the phenomena and then generalizes to determine what the laws are. When we look at Newton more closely, however, we see that things are not so different after all. Consider a famous quote, which has analogs elsewhere in Newton's writings:

This analysis consists in making experiments and observations, and in drawing general conclusions from them by induction... By this way of Analysis we may proceed from Compounds to Ingredients, and from Motions to the Forces producing them; and in general, from Effects to their Causes, and from particular Causes to more general ones, till the Argument ends in the most general. This is the Method of Analysis: And the Synthesis consists in assuming the Causes discover'd, and establish'd as Principles, and by them

as clearly, perfectly, and distinctly in his Understanding, and perhaps more distinctly, than the Philosopher, who hath busied himself in considering their Natures..."

⁴⁶ My example is (loosely) drawn from §40 of *Of the Conduct of the Understanding*.

⁴⁷ Newton's precise methodology is, of course, a subject of debate. Nevertheless, I think the broad points I make in this section are relatively non-controversial.

explaining the Phaenomena proceeding from them, and proving the Explanations.⁴⁸

The *Principia* uses a method of synthesis; Newton assumes the truth of his definitions and laws and then demonstrates their adequacy by showing that they can account for a number of observed phenomena. But this is merely the order of explanation, not necessarily the order of discovery. For Newton writes that “As in mathematics, so in natural philosophy, the investigation of difficult things by the method of analysis, ought ever to precede the method of composition [synthesis].”⁴⁹

What did the method of analysis consist in for Newton? Well, the first step was the collection of vast amounts of data (through observation and experiment). Of course, Newton was able to draw on the work of many others here. For all of Newton’s frustration with Flamsteed, the *Principia* would have been much harder to produce without his painful observations and calculations.⁵⁰ The second step was the observation and codification of various regularities in the collected data. This is what allows for the induction of general principles. Eventually, this process issues *laws*: in Newton’s case, the three laws of motion.

Furthermore, it seems to me that Newton’s laws describe observed phenomena rather than produce them. Newton does not understand the laws as seats of causal power; they do not produce the phenomena. Newton has a different conceptual category to explain how phenomena are actually produced: forces. What the laws do is describe the actions (and

⁴⁸ Newton 2004, page 139. Consider an alternative formulation from one of Newton’s letters to Roger Cotes: “I like your [Cotes’] design of adding something more particularly concerning the manner of philosophizing made use of in the *Principia* and wherein it differs from the method of others, viz. by deducing things mathematically from principles derived from phenomena by induction. These principles are the three laws of motion. And these laws in being deduced from the phenomena by induction....” Newton 2004, page 119.

⁴⁹ Newton 2004, page 139.

⁵⁰ And, for what it is worth, when Flamsteed’s observations were finally published they were titled *Historia Coelestis Britannica*. So the *Principia* was, in a sense, based on generalizations made out of a natural *history*.

interactions) of the forces which are (at the very least, conceived of as) causally responsible for the production of phenomena. Here is one instance in which Newton discusses the relationship between the two:

...it may also be allow'd that God is able to create Particles of Matter of several Sizes and Figures, and in several Proportions to Space, *and perhaps of different Densities and Forces, and thereby to vary the Laws of Nature*, and make Worlds of several sorts in several Parts of the Universe.⁵¹

I read Newton here as indicating it is the objects under study (in his case material bodies) and their behavior which gives rise to the laws and not the other way around. It is by altering the forces that bodies have that God could alter the laws of nature, not *vice versa*. And it is by creating bodies with certain features that God creates the laws, there are not two separate steps (the creation of the bodies followed by the decreeing of the laws).

6.3 Locke and Powers

What other sorts of reasons can we have for thinking that Locke endorsed the descriptive picture of laws I outlined above. In this section I want to suggest that Locke's emphasis on *powers* as the locus of causal force is one such reason. In the next section I shall argue that Locke's comments on God's omnipotence cohere better with a descriptive account of laws than with a causal account of laws.

One rather embarrassing fact for interpretations of Locke that claim he understands laws as vital to the production of natural phenomenon is Locke's near absolute silence on the topic of laws. Peter Anstey, for example, has managed to find only fifteen places in Locke's

⁵¹ Newton 2004, page 139. Emphasis added. Of course, given the sometimes speculative nature of the *Queries* to the *Opticks*, from which this quote is drawn, we cannot take it as a definitive statement of Newton's views. Nonetheless, I think it is revealing of the way he was inclined to think about the matter.

entire corpus where the subject arises.⁵² To this I would add that in many of these passages Locke is only using nomic language after it has first been introduced by an interlocutor or when he is discussing a position held by someone else. And many of the other passages occur in liminal works whose focus is not metaphysics or natural philosophy.

Even more striking than the small number of places where talk of laws is present in Locke is the large number of places where talk of laws is absent. If Locke believed that the laws of nature were truly responsible for the production of natural phenomena then there are a number of passages in which one would expect Locke to at least refer to them but in which they are wholly absent. Here is a short list (meant to be representative rather than exhaustive): 1) 2.26 is the chapter “Of Cause and Effect.” Here Locke lays out his account of how we acquire our causal ideas and what they are like. Laws are not mentioned at all, let alone as fundamental to either the causal structure of the universe or our understanding of causal processes. 2) 4.12 is the chapter “Of the Improvement of our Knowledge.”⁵³ Much of the chapter is concerned with the way to advance our knowledge of the material realm. Yet Locke makes no mention of laws of nature in the chapter. 3) 4.6.11 in the chapter “Of Universal Propositions, their Truth and Certainty” is the section devoted to the powers which make up our complex ideas of substances. In this section Locke goes on at great length suggesting that the powers that bodies have might depend on things other than those bodies themselves. But nowhere in this long passage does Locke suggest that *laws* are things which might alter the powers of bodies. Instead, Locke suggests it is *other bodies* which determine

⁵² Anstey 2011, page 162. All of the passages mentioned by Anstey have either already been discussed or will be considered in detail in Section 7.

⁵³ The chapter does contain a brief mention of laws at 4.12.4 but the context is politico-moral, not natural-philosophical.

what a body can do. 4) 2.8 contains what Locke himself refers to as a digression into “physical enquiries.”⁵⁴ Here Locke offers a detailed discussion of the different kinds of powers bodies have and how bodies interact with one another and with our minds. But nowhere in this section does Locke mention laws. If Locke really believed that laws or divine volitions were central to the workings of nature it is bizarre that they are not mentioned in the passages where he explicitly discusses these workings.

We can usefully contrast Locke’s silence on the topic of laws with his nearly incessant use of “power” and its variants. Powers are mentioned in passing throughout the *Essay* but they are also a key component of several of the *Essay*’s signature doctrines. Locke’s account of primary and secondary qualities, his account of free will and voluntary action, his views on our ideas of substances, and his embrace of a causal theory of perception are all formulated in terms of the powers held by objects. It seems to me that Locke consistently advocates for an understanding of nature in terms of the *powers* held by bodies. Bodies and their powers, rather than laws of nature, are the locus of causal and scientific explanations.

Locke’s embrace of powers as the primary engines of causal processes not only motivates against a view of laws of nature as causal, it also accords nicely with the interpretation which holds that laws of nature are descriptive. The laws of nature are generalizations that help us to track and catalogue the powers that we observe bodies to have. Just as Newton’s laws formally model the forces which generate phenomena, Lockean laws model the powers which generate phenomena.

6.4 Locke on God’s Omnipotence

⁵⁴ 2.8.22.

In this section I want to show that Locke's remarks on divine omnipotence also motivate a descriptive rather than a causal view of laws of nature. A commitment to divine omnipotence is superficially straightforward. The view is just that God can do anything. But, of course, matters are not so simple. Consider the different ways in which Descartes and Leibniz were committed to divine omnipotence. Descartes, on a popular interpretation, held that divine omnipotence meant that God, if He so chose, could make it such that $2 + 2 = 5$. Leibniz, on the other hand, thought divine omnipotence only entailed that God could do all *possible* things. Locke was, on the whole, quite restrained in discussing the divine nature. Nonetheless, several of his remarks are worth examining. Above, we looked at one passage from the *Reasonableness of Christianity*, which suggested that Locke thought God shied away from brute fact-making. When we look at other relevant passages we again see that Locke preferred to think of divine omnipotence as the power of creating objects and powers and not as the power of creating facts or states-of-affairs.

At 4.3.6 Locke writes that God should be able to make a material object think: "For I see no contradiction in it, that the first eternal thinking Being [or omnipotent Spirit] should, if he pleased, give to certain Systems of created sensless matter, put together as he thinks fit, some degrees of sense, perception, and thought..."⁵⁵ Locke's claim is not that an omnipotent being would simply make it the case that a material object thinks. Instead, he claims that an omnipotent being would *give* something to the system of matter. Locke maintains the same attitude in the Stillingfleet correspondence where he writes that the question is "not what

⁵⁵ 4.3.6. The phrase 'or omnipotent Spirit' was in the 2nd, 3rd, and 4th, editions of the *Essay* and removed in the 5th.

matter can do of itself, but what matter *prepared* by an omnipotent hand can do.”⁵⁶ God *does* something to the matter (prepares it) before it will behave in a certain way. Simply willing is not enough. Or again: “the fathers of the Christian church never pretended to demonstrate that matter was incapable to *receive* a power of sensation, perception, and thinking, from the hand of the omnipotent Creator.”⁵⁷ Again, God does something to bodies so that they behave in a certain way. He does not, by bare fiat, make them behave a certain way.

Locke’s attitude with respect to omnipotence and gravity is similar. He does not claim that gravity is evidence that God can simply forge a connection between bodies. Instead, he writes that gravity is evidence that “God can, if he pleases, put into bodies powers and ways of operation...”⁵⁸ God, in order to make it the case that bodies mutually attract, does more than simply will that they do so. He also *puts powers into* bodies; He creates substances or modifies the substances he has created.

A complete account of how Locke understands divine omnipotence is beyond the scope of this chapter. My hope is just that I have done enough to show that there is a pronounced trend in Locke’s statements on the subject. Specifically, I think I have shown that Locke is happy to talk about God *creating* substances that behave in certain ways or to talk about God *giving* powers to substances. But Locke does not seem to talk about God *making it the case* that bodies behave in a certain way or *establishing* laws which govern the motions of bodies. I believe that this aligns neatly with a descriptive view of laws of nature.

⁵⁶ Locke 1823, volume 4, page 36. Emphasis added. Locke here also uses the language of “giving” which was present at 4.3.6: “But this hinders not, but that if God, that infinite, omnipotent, and perfectly immaterial spirit, should please to *give* a system of very subtile matter sense and motion, it might, with propriety of speech, be called spirit; though materiality were not excluded out of its complex idea.” Emphasis added. Instances of Locke using “giving” or “bestowing” language in this manner could be multiplied.

⁵⁷ Locke 1823, volume 4, page 469.

⁵⁸ Locke 1823, volume 4, page 467.

6.5 Anstey on Principles and Laws

In his recent book Peter Anstey has advised caution in thinking that Locke understood the laws of nature as generalized empirical inductions, or, to use Anstey's preferred terminology, "principles" of natural philosophy. He does allow that this notion plays an important role in Locke's thinking about natural philosophy and that Locke "intimates" a connection between principles and laws.⁵⁹ But Anstey cautions that Locke nowhere identifies principles with laws of nature.

I am in agreement with Anstey that Locke nowhere makes this connection explicit.⁶⁰ Nevertheless I think we are still justified in believing that Locke understood laws as generalized inductions. We know that Locke believed there were things called "laws of nature", he mentions them (albeit rarely) in his texts. So there is an open question concerning how he understood these laws. Given this, the question is not one of whether Locke explicitly identified laws with generalized inductions. The question is instead one of what we, as interpreters of Locke, should believe given the available textual evidence, contextual concerns, and philosophical considerations. I have argued above that the available textual evidence, a number of factors in Locke's scientific context, and a number of philosophical arguments point to the conclusion that Locke was attracted to the view that

⁵⁹ Anstey 2011, page 164. For Anstey's larger discussion see pages 162-166.

⁶⁰ That said, when discussing gravitation Locke writes that although we do not understand gravitation the fact that bodies do gravitationally attract one another should be "taken as a principle in natural philosophy." *Elements of Natural Philosophy*, chapter 1. Locke 1823, volume 3, page 305. Read in context, Locke here comes extremely close to explicitly identifying the inverse square law with empirically observed regularities, or principles.

laws are generalized inductions. A straightforward piece of text would be nice, but in its absence we must do the best we can.⁶¹

There is also a linguistic point to be made here. Locke does talk about principles and laws, and he never explicitly identifies them. But I do not believe this should mean that some principles of natural philosophy are not laws for Locke. After all, in good Lockean fashion, we should not focus on the words used, but on their referents.⁶² As noted at the beginning of this section, the approach toward laws which I think we find in Locke was still being developed at the close of the seventeenth century, so we should not be too surprised if we find some linguistic variation among its adherents. More importantly, we should note that Newton was willing to equate (at least some) principles with laws.⁶³ And Boyle also used “law” and “principle” to mean the same thing at many places.⁶⁴ So I think we might also expect some flexibility in Locke’s terminology.

Another factor is that in Anstey’s discussion he is primarily concerned with *explanation* and whether or not Locke supports nomological explanations. But it seems to me that this is the wrong tack. If I am right that Locke understood laws as generalized inductions then it is clear why Locke does not view laws as explanatory and why he shies away from nomic explanation. If the laws are descriptive, rather than causal, it is clear that they will have limited explanatory value. On this view, the laws are not useful because they

⁶¹ Clearly Anstey agrees with this as a general approach to historical texts. Just a few pages prior to his remarks on laws he attributes something called the “Reduction Principle” to Locke and says the following: “Locke nowhere in the *Essay* explicitly states that this is an explanatory principle, but there is ample evidence that this principle is implicit in his articulation [of other points].” Anstey 2011, page 155.

⁶² I take this to be a key lesson of Book 3 of the *Essay*.

⁶³ Newton 2004, page 119: “These principles are the three laws of motion. And these laws in being deduced from the phenomena by induction...” We might note as well that Newton sometimes uses “rule” and “law” interchangeably. See Steinle 1995, page 353.

⁶⁴ See Steinle 1995, page 334.

explain phenomena, they are useful because they allow us to more easily talk about, predict, and find relations between phenomena.

Anstey's other reason for rejecting a close association between laws and generalized inductions is that this understanding of laws is inconsistent with Locke's claims at 4.3.29. Anstey believes that if Locke had come to understand laws as generalized inductions he would have needed to modify this passage, and possibly other passages in Book IV. In the next section I will analyze this text. I do not believe it is incompatible with my interpretation of Locke. More importantly though, I think we should be hesitant about arguing points on the basis of changes that Locke *failed* to make to the *Essay*. We should remember that the *Essay* is a very long book which was constructed piece-meal over a very long period of time. And we should remember that Locke was by no means the most committed editor or reviser of his own work. By his own admission Locke was in many instances "too lazie, or too busie" to revisit his own work for the purpose of improving it.⁶⁵ We might also recall that *Of the Conduct of the Understanding*, which I quote from above, was originally intended to be a new chapter of the *Essay*. Finally, given that this view of laws was still emerging at the time that Locke was writing, we might understand if his thinking about laws was not as rigorously consistent as we might like.

7. Texts

I have already discussed many of Locke's texts which are relevant to laws of nature. The purpose of this section is to examine and analyze those that remain. My goal is to show that they are all compatible with the inductive generalization reading I offered in Section 6

⁶⁵ Epistle to the Reader.

and that none of them conclusively support the view of laws as causally efficacious that I rejected in Sections 3-5.

In compiling this list of texts I have relied heavily on the list provided by Peter Anstey.⁶⁶ As previously mentioned Anstey, who knows Locke's corpus as well as any commentator, managed to find a mere fifteen discussions of laws of nature in Locke. I argued above that this in itself is instructive and gives us good reason to think that Locke did not understand laws as fundamental to the production of natural phenomena. And, as we will see, none of these texts offer a very substantive or meaningful discussion of how Locke *did* understand laws of nature.

I will now begin my analysis of these passages. I will present each passage, prefaced by a number, and then offer some commentary.

1. [T]he philosophers and principally the moderns imagine that God has prescribed the same laws for the formation and the conservation of his works and they have tried to explicate by them divers effects of nature. Mr Newton sets himself the same aim and takes the same way in this treatise.⁶⁷

This passage is from Locke's review of Newton's *Principia* in the *Bibliothèque universelle et historique*. This is clearly an instance in which Locke brings up laws in the context of discussing others' work. So he does not seem to be endorsing any particular view in this passage. And, as Anstey notes, this is "merely a paraphrase of Newton's description of the project of the *Principia* in his 'Preface to the Reader'".⁶⁸

2. Your second argument against accommodating mathematics to the nature of material things is, "that mathematicians cannot be certain of the manner and

⁶⁶ Anstey 2011, page 162, note 36.

⁶⁷ Translated by Anstey 2011, pages 162-163.

⁶⁸ Anstey 2011, page 163.

degrees of force given to bodies so far distant as the fixed stars; nor of the laws of motion in other systems." A very good argument why they should not proceed demonstratively in this our system upon laws of motion, observed to be established here: a reason that may persuade us to put out our eyes, for fear they should mislead us in what we do see, because there be things out of our sight.⁶⁹

This passage is from Locke's *Second Reply* to Stillingfleet. Again, I think that this is an instance in which Locke is only discussing laws after they have been brought up by an interlocutor. Furthermore, Locke here seems much more interested in scoring a cheap point against Stillingfleet than in mounting a serious case for a certain scientific methodology. Of course, Locke does here talk about laws which are *established* which might give support to the claim that laws are divine volitions or things which God must independently decree. But it seems to me that this language of establishment is equally compatible with a view on which God creates objects with powers and the laws are determined by the powers the bodies have. On this view the establishment of the laws would just *be* the creation of the objects along with their powers.⁷⁰

3. This then being taken for granted, and it would be wrong to doubt it, namely, that some divine being presides over the world--for it is by His order that the heaven revolves in unbroken rotation, the earth stands fast and the stars shine, and it is He who has set bounds even to the wild sea and prescribed to every kind of plants the manner and periods of germination and growth; it is in obedience to His will that all living beings have their own laws of birth and life; and there is nothing so unstable, so uncertain in this whole constitution of things as not to admit of valid and fixed laws of operation appropriate to its nature--it seems just therefore to inquire whether man alone

⁶⁹ Locke 1823, Volume 4, page 427.

⁷⁰ To use a comparative example, one might say that to establish a colony on Mars the United States would have to have an astronaut read out a proclamation upon the founding of the colony. But one might also think that once the astronauts have arrived, the buildings have been built, and humans are living there, there is simply nothing more to do; the colony has already been established at that point.

has come into the world altogether exempt from any law applicable to himself, without a plan, rule, or any pattern of his life.⁷¹

This passage is from the very first paragraph of Locke's *Essays on the Law of Nature*. There are a host of reasons for discounting the importance of this passage. It is a very early Locke text, one of the earliest we have. This is an introductory paragraph, the main point of which is merely to suggest that there is a divine ordering to the world (never mind what the exact details of that ordering are) with the hope of motivating the larger project of the work. And the larger project of that work is a discussion of human ethics, not a discussion of the inner workings of nature.⁷² Also worth noting is that Locke seems to endorse a geocentric universe in this passage ("heaven revolves...the earth stands fast") which surely is not his considered view. Finally, in this passage Locke runs together discussion of laws of nature with moral laws. As I will discuss in greater detail when analyzing Passage 9 this is very problematic.

4. ...when yet it is evident, that by mere Matter and Motion, none of the great Phænomena of Nature can be resolved, to instance but in that common one of Gravity, which I think impossible to be explained by any natural Operation of Matter, or any other Law of Motion, but the positive Will of a Superiour Being, so ordering it.⁷³

This passage is from Locke's *Some Thoughts Concerning Education*. This alone should give us pause. The book is meant to be about the proper education of children, and not a serious work of natural philosophy. And the main point of the discussion in which this passage occurs is to suggest that children be given very thorough religious training before

⁷¹ Locke 1954, page 109.

⁷² One might also point out that the *Essays on the Law of Nature* was initially written as a set of lecture notes. So there is the difficult interpretive question of where Locke is propounding his own views and where he is presenting the positions (drawn from Grotius or Culverwel or elsewhere) that students are meant to learn. Further, these lectures were given in Locke's capacity as Censor of Moral Philosophy (Senior Censor). There was a separate post at Christ Church for Natural Philosophy (Junior Censor).

⁷³ *Some Thoughts Concerning Education*, §192. Locke 2007, page 160.

they are allowed to study natural philosophy. So the passage is not meant to be an extended discourse on natural philosophy or laws of nature.⁷⁴

As such, I am inclined to give very little weight to this passage. If, however, we do want to use this passage to explicate Locke's views on the laws of nature then I believe it will support the position I am defending in this chapter. Consider Locke's claim that there is no law of motion which can explain gravitation. Now, Locke obviously endorsed the laws of nature examined in Newton's *Principia*. And he clearly believed that one of these laws pertained to the gravitation of matter toward matter (see Passage 5). Now, if Locke understood laws as inductive generalizations over observed phenomena (in the way I suggested that Newton understood them) then this is unproblematic. Locke's view is that there is a settled law of nature (an observed regularity), but we do not understand the mechanisms underlying it. If, however, one understands the law of gravitation as being, like all the other laws of motion, a divine volition, then the passages becomes very problematic. First, we'll have it again that the laws of nature are not really explanatory. Second, and much more problematic, is that Locke seems to want to *distinguish* here between laws of nature and divine volitions. He says that a law of nature cannot explain something that can be explained by the positive will of God. So, at worst, I think this passage is inconclusive and confusing. At best, I think it motivates against a view of laws as causally efficacious divine volitions.

5. It appears, as far as human observation reaches, to be a settled law of nature, that all bodies have a tendency, attraction, or gravitation towards one another.⁷⁵

⁷⁴ And indeed, it seems to me that one would be extremely hard-pressed to offer a consistent and coherent interpretation of the passage as a whole.

⁷⁵ *Elements of Natural Philosophy*, chapter 1. Locke 1823, volume 3, page 304.

This passage is from Locke's *Elements of Natural Philosophy*. Again, this is not a text central to the Lockean corpus. Locke wrote the *Elements* for a child and there is some indication that Locke never desired to have the *Elements* published.⁷⁶ But even if we do take this text seriously I think it supports the view of law as generalizations. First, there is the general epistemic flavor of the passage ("as far as human observation reaches" and slightly later in the section "though made evident to us by experience."⁷⁷). More importantly, however, is the fact that Locke suggests the gravitationally attracted objects (rather than God or a law) are the actors in these situations. He writes that "Two bodies at a distance will *put one another into motion* by the force of attraction..."⁷⁸ The bodies, and not a law, supply the causal force. So this passage either supports the interpretation of laws as generalizations or is neutral.

6. In answer to which, it is enough to say, that this objection is of no force, but in the mouth of one who can produce a definition of a miracle not liable to the same exception, which I think not easy to do; for it being agreed, that a miracle must be that which surpasses the force of nature in the established, steady laws of causes and effects, nothing can be taken to be a miracle but what is judged to exceed those laws. Now every one being able to judge of those laws only by his own acquaintance with nature, and notions of its force (which are different in different men), it is unavoidable that that should be a miracle to one, which is not so to another.⁷⁹

7. For miracles being the basis on which divine mission is always established, and consequently that foundation on which the believers of any divine revelation must ultimately bottom their faith, this use of them would be lost, if not to all mankind, yet at least to the simple and illiterate (which is the far greatest part) if miracles be defined to be none but such divine operations as

⁷⁶ See Stuart 1998, pages 378-379.

⁷⁷ *Elements of Natural Philosophy*, chapter 1. Locke 1823, volume 3, page 305.

⁷⁸ *Elements of Natural Philosophy*, chapter 1. Locke 1823, volume 3, page 305.

⁷⁹ *Discourse of Miracles*. Locke 1823, volume 9, page 256-257.

are in themselves beyond the power of all created beings, or at least operations contrary to the fixed and established laws of nature. For as to the latter of those, what are the fixed and established laws of nature, philosophers alone, if at least they, can pretend to determine.⁸⁰

These two passages are both from Locke's *Discourse on Miracles*. I think this is another instance in which we can claim that Locke is only bringing up laws of nature in response to an interlocutor. Locke tells us at the end of the *Discourse* that "These thoughts concerning miracles were occasioned by my reading Mr. Fleetwood's Essay on Miracles, and the letter writ to him on that subject."⁸¹ So Locke seems to be responding (at least in part) to Fleetwood's endorsement of the common position that a miracle involves a violation of a natural law: "I think, it will follow from hence, that nothing new, strange, prodigious, and astonishing, can be accounted properly *miraculous*, unless it thwart the common Course of Nature, and overthrow some settled Law of the Creation."⁸² Locke means to be discussing miracles and theology in this work and is only mentioning laws of nature in passing while responding to an opponent.⁸³ So there is no reason to think we will learn much about his position on laws from these passages.

If however, we want to examine these passages for content I think we will not get far. The first passage has a distinctly epistemic air. Locke might easily be read as suggesting that what the laws are depends on who the observers are. And in the latter passage Locke

⁸⁰ *Discourse of Miracles*. Locke 1823, volume 9, page 264.

⁸¹ Locke 1823, volume 9, page 265.

⁸² Fleetwood 1702, page 4. Or, more straightforwardly on page 2: "An extraordinary Operation of God against the known Course, and settled [sic] Laws of Nature, appealing to the Senses."

⁸³ And, indeed, in this work Locke ends up endorsing a (rather more Augustinian) view of miracles which understands them as mere unusual events which inspire their viewers and which makes no specific reference to laws of nature.

expresses some skepticism about the ability of even natural philosophers to discern the laws of nature. It seems to follow from this that he did not think they played an integral role in scientific explanation.

Thus far this section has only considered rather marginal texts. They primarily come from minor works and mention laws only in passing or after they have been brought up by someone else. Furthermore, none of the passages seems very helpful in constructing an interpretation of Locke on laws. We now need to turn, however, to two passages which are far more substantive. Both come from the *Essay* and both have been thought to offer support for the view of laws as causally efficacious divine volitions.

8. Our simple *Ideas*, being barely such Perceptions, as God has fitted us to receive, and given Power to external Objects to produce in us by established Laws, and Ways, suitable to his Wisdom and Goodness, though incomprehensible to us, their Truth consists in nothing else, but in such Appearances as are produced in us, and must be suitable to those Powers, he has placed in external Objects, or else they could not be produced in us...⁸⁴

Here Locke suggests that there is a law which governs the production of ideas in our minds by external objects. I think the passage does not obviously support the view that laws are causally efficacious or that they are divine volitions. The language of “established laws” might hint at this position, but as discussed above, it is hardly conclusive. It might be that what it is for God to establish a law is for Him to create objects that behave in set and predictable ways.⁸⁵

⁸⁴ 2.32.14.

⁸⁵ And, indeed, Locke does use the language of “ways” immediately after the language of laws. To me, this language of “ways” makes it harder to read the passage as one in which Locke is saying anything substantive about laws of nature. Instead, it just seems to me that Locke is loosely gesturing at the fact that God has organized the world such that bodies reliably produce ideas in us. And, given the context of the passage, that is the only point Locke needs to be making. But this is a minor point.

Note as well that Locke has powers playing a critical role in this passage. Locke is saying that in order for humans to have sensations God must “fit us to receive” them. That is, he must give the mind passive powers. God must also “give power to external objects” if they are to actually produce ideas in us. That is, he must give them active powers. On the view I have defended in this chapter this is entirely appropriate. Laws are merely ways of describing the powers that various bodies have to causally interact with one another. There is nothing in this passage that suggests that bodies or minds acquire these powers in virtue of there being certain laws. If anything, the passage motivates in the other directions. Locke only mentions that ideas are produced in law-like ways after he mentions that God gives minds and bodies certain powers.

I also think that when read in light of the passages from the *Examination of Malebranche* the force of this passage will be severely blunted. Recall that in the *Examination* Locke discusses the very view he mentions here: that ideas are produced in us according to a law. Locke view was that this position offers little or no explanatory leverage. It is not much more comprehensible that Malebranche’s view. And note that at the end of Passage 8 Locke reaffirms his commitment to the incomprehensibility of body-mind interactions. So it will be difficult to use this passage in support of the view that Locke thought laws were particularly explanatory.

9. [A] But the coherence and continuity of the parts of Matter; the production of Sensation in us of Colours and Sounds, *etc.* by impulse and motion; nay, the original Rules and Communication of Motion being such, wherein we can discover no natural connexion with any *Ideas* we have, we cannot but ascribe them to the arbitrary Will and good Pleasure of the Wise Architect. [B] I need not, I think, here mention the Resurrection of the dead, the future state of this Globe of Earth, and such other Things, which are by everyone acknowledged to depend wholly on the Determination of a free Agent. [C] The Things that, as far as our Observation reaches, we constantly find to proceed regularly, we

may conclude, do act by a Law set them; but yet by a Law, that we know not: whereby, though Causes work steadily, and Effects constantly flow from them, yet their *Connexion* and *Dependencies* being not discoverable in our *Ideas*, we can have but an experimental Knowledge of them.⁸⁶

This is probably the best piece of evidence for the claim that Locke understood laws as causally efficacious and as divine volitions. But as we shall see, it is a complicated passage and difficult to explicate clearly.

The first point to make pertains to the general gist of the passage. Locke is not here discussing physics or natural philosophy. His primary goal in this passage, and in the entire chapter it is drawn from, is to stress the severe limits to human knowledge. In Sentence A Locke does allow that there are “Rules” by which motion is communicated among matter. But his reason for mentioning them is to point out that we do not know these rules. And in Sentence C Locke does mention a law but only for the purpose of pointing out that we do not know that law. Additionally, understanding that the goal of the passage is to discuss limits on human knowledge, rather than to make a point about laws of nature, seems to be the only way to make sense of the presence of Sentence B in this passage.

Locke’s locution “by a law set them” is also problematic. Locke’s considered position is that only intelligent agents are capable of following a law. This is the difference between moral laws and laws of nature. The moral law is a divine decree which Lockean agents come to know and elect to follow. The moral law is never an efficient cause of human actions, it acts rather more like a formal cause. By contrast, those who understand Lockean laws of nature as causally efficacious want them to be efficient causes. They believe that the laws of nature themselves determine the course phenomena take. The problem with this

⁸⁶ 4.3.29.

passage is that Locke's language of "setting" seems to require an intelligent agent. But Locke does not think that billiard balls, for example, are intelligent. And so he does not think that billiard balls are capable of "having a law set for them" in anything but a metaphorical sense. They are not capable of acting in accord with the laws of motion set them by God in the same way that I am capable of acting in accord with the laws concerning traffic set by the town council.⁸⁷ So Locke's language of "a law set them" is quite puzzling here. I think we should take this as evidence that Locke is speaking quite loosely in this passage. The context of the passage only requires him to establish that there are causal processes in nature which exceed our comprehension. Trying to unpack the passage so that it tells us how Locke conceived of the mechanics of these in-principle unknowable processes seems to be an odd task.

Anstey's list of passages where Locke discusses laws of nature contains a few other references. One of these references we have already seen. This is the discussion from the *Examination of P. Malebranche* in which Locke suggests that the laws of nature have no more explanatory force than Malebranche's bizarre hypothesis. Anstey also provides a citation to *Of the Conduct of the Understanding*.⁸⁸ I have not included this passage because while Locke does here discuss Newton, gravitation, and foundations for natural philosophy the discussion is not obviously about laws. Locke does not use the word "law" or any other nomic language in this passage. The same is true of 4.3.13. While this section does contain a rather abstract discussion of mechanics there is no mention of laws and no good reason to think that the passage could tell us much about Locke's views on laws. Finally, Anstey

⁸⁷ Boyle sometimes seems to endorse this view as well. See Boyle 1999-2000, volume 10, pages 457 and 464.

⁸⁸ Specifically to Locke 1823, volume 3, page 282.

mentions a note which appears twice in Locke's notebooks (it appears in Ms. Locke c. 33, fol. 284 and in Ms. Locke d.11, fol. 51v). Here is my transcription of the note in c.33:

Mechanisme. There are phaenomena in nature of wch
noe mechanical reason can be devised & others that are perfectly
crosse to the laws of Mechanisme of both wch kindes there
have ben other instances proposed by my learned friend Dr
More in his Enchirido[n] Metaphysicum & very ingeniously
improved by him. Cudworth 148/899

And here is my transcription of the note from d.11:

Instances of phaenomena in
nature transcending the power, or
crossing the laws of Mechanisme
have been proposed by my learned
friend Dr More in his Enchiridi
on Metapysicum & very ingeni
ously improved by him to evince
that there is something in nature
besides mechanisme Cudworth
148/899

I am inclined to discount the importance of this note. First, Locke makes it very clear in both notes that he is merely paraphrasing a passage from Cudworth's text, rather than endorsing the view.⁸⁹ Second, Locke's notebooks contain hundreds of notes like these, some from authors Locke agreed with and some from authors he disagreed with and disapproved of. Finally, I am inclined to think that passage is indicative more of Locke's keen interest in the limits of mechanism than of any substantive position Locke had on the laws of nature. This would explain the section heading "Mechanisme" in the c.33 notebook and the section heading "Magnes." and references to Descartes' *Principles* and William

⁸⁹ The tell here is "Cudworth 148/899". Locke's method of citation involved writing the page number the copied passage was from on top of the total number of pages in the edition of the work that Locke owned and separating the two by a horizontal bar, the end result looking like a fraction. See Harrison and Laslett, pages 33-34. And indeed, the 1678 edition of Cudworth owned by Locke does have 899 numbered pages and page 148 does contain a discussion of the limits of mechanism and a citation to More's *Enchiridion*. For Locke's ownership of this edition see Harrison and Laslett 1971, page 119.

Gilbert on the same page as the note in the d.11 notebook.

In this section I have tried to argue that there are no Lockean texts that conclusively support the view of laws as causally efficacious divine volitions. All of the texts are equally compatible with the view that Locke understood laws as inductive generalizations. That said, I think this review of the salient texts can also help us to see a larger point. Locke almost never discusses laws of nature. When he does it is almost always after they have been mentioned by someone else or in an off-hand manner. As such, I think we must be wary of views which claim that Locke understood laws of nature as fundamental to the production of natural phenomena. Locke seemed to believe that their role in natural philosophy was far more limited.

8. Conclusion

This chapter has considered two very different approaches to laws of nature in Locke. One approach holds that laws of nature are foundational to Locke's understanding of the universe. I have argued that this view is problematic. It is underspecified and very difficult to square with many of Locke's other commitments. It also faces serious dearth of textual support. On the other view, laws of nature have nothing to do with the workings of the universe (at least as far as human understanding can discern). This view is compatible with Locke's textual emphases and with the scientific programs he most approved of.

6. Locke on Hypotheses and Methodology

For indeed, natural philosophy (as is generally managed) is little else than a learned romance, which may amuse and divert, but can never satisfy the mind of man, which is fed only by experiment and demonstration, and not with gay empty speculations or spruce hypotheses.

- St George Ashe¹

And therefore we may rationally expect a greater Improvement of Natural Philosophie from the *Royall Society*, (if they pursue their design) then it has had in all former ages; for they have discarded all particular *Hypotheses*, and wholly addicted themselves to exact Experiments and Observations, they may not only furnish the World with a compleat *History of Nature*...but also lay firm and solid foundations to erect *Hypotheses* upon...

- Samuel Parker²

1. Introduction

This chapter has two goals. The primary goal of this chapter is to determine Locke's position with regard to the proper role of hypotheses in natural philosophy. My position will be that Locke embraced hypotheses and thought that they were an important part of scientific

¹ From Ashe's "A Discourse of the Air..." (1686). Transcribed in Hoppen 2008, volume 1, page 148.

² Parker 1666, page 45.

theory and practice, provided they were of the right kind. The secondary goal of this chapter is to show how this finding can shed light on a recent debate about Locke's position on scientific methodology. Some commentators have found a tension in Locke's support for both natural history (as exemplified by Sydenham) and mathematical physics (as exemplified by Newton). I contend that once we understand Locke's position on hypotheses this tension will disappear and it will be clear why Locke supported both methodologies.

2. Locke's Mixed Attitude Toward Hypotheses

Before proceeding, a brief note on terminology is required. Finding the right language to use when talking about hypotheses in the early modern period can be a difficult task. "Hypothesis", "principle", "law", "law of nature", "generalization", "rule", and "idealization" were all common ways to refer to a similar concept. But usage of these words differed greatly among philosophers and natural philosophers of the seventeenth century. More problematically, usage could vary within the work of a single thinker. For example, I.B. Cohen has isolated some nineteen different uses of the word "hypothesis" in the works of Newton.³ An hypothesis, in the sense of the word I will be using, is a generalized principle abstracted from a set of scientific phenomena and used to make claims and predictions about a different set of scientific phenomena.⁴ Questions about whether Locke accepted hypotheses are questions about whether (and when) Locke was willing to license these general statements and whether (and when) he thought generalizations from one series

³ See Appendix 1 in Cohen 1956.

⁴ It is important to emphasize that this sense of the word differs greatly from the meaning commonly in use today. In more contemporary usage, the origin of a hypothesis (the "context of discovery") is unimportant; it is merely a starting point for research which seeks to confirm or disconfirm it (the "context of justification"). This is not true for the historical sense of "hypothesis" which is at issue here. For hypotheses in the historical sense of the term the origin of the hypothesis is very important.

of examinations could be validly exported to unexamined phenomena. My claim is that Locke has much to say on this topic and that careful attention to those passages can help settle questions about Locke's scientific thought.

The reason that there is a debate over Locke's position on hypotheses is that Locke's statements regarding hypotheses are decidedly mixed. Very often he speaks of them pejoratively, suggests that they do not have an integral role to play in natural philosophy, or suggests that they are actively harmful to natural philosophy. The title of section 4.12.12 of the *Essay* says that the reader "must beware of Hypotheses." In the next section Locke writes that "most (I had almost said all) of the *Hypotheses* in natural Philosophy" are "doubtful conjectures."⁵ Or consider his *Examination of P. Malebranche* where Locke uses the word "hypothesis" to refer repeatedly to the absurd Malebranchian doctrine of vision in God.⁶ The usage here is clearly meant to be pejorative. Locke's manuscript on smallpox says that "'tis but ostentation & losse of time to lay down hypothesis which are many times false [and] always uncertain."⁷ This is Locke's negative attitude toward hypotheses.

In other passages, however, Locke is much more sanguine about the prospects for hypotheses in natural philosophy, and he sometimes suggests that hypotheses both can and should play an integral role in natural philosophy. Section 4.12.13 of the *Essay* is entitled "The true use of Hypotheses." The section begins by giving an explicit endorsement of hypotheses claiming that "if they are well made" they can not only aid the memory but "often direct us to new discoveries." In *Some Thoughts Concerning Education* Locke writes that it

⁵ 4.12.13.

⁶ Locke 1823, volume 9, pages 211, 214, 215, 219, 220, 221, 224, 225, 228, and 240.

⁷ Reprinted in Romanell 1984, page 71.

is “fit” to proceed on the hypothesis that the sun is at the center of the solar system.⁸ Most striking is one of Locke’s manuscripts entitled “Method” which begins by claiming that “The way to finde truth as far as we are able to reach it in this our darke & short sighted state is to pursue the hypothesis that seems to us to carry with it the most light & consistency...”⁹ This is Locke’s positive attitude toward hypotheses.

The apparent lack of a clear textual position on hypotheses has led to a split among commentators. One group of commentators has attempted to emphasize the passages which display Locke’s negative attitude toward hypotheses. Their view is that hypotheses have, at most, a liminal and subservient role in Lockean natural philosophy.¹⁰ A second group of commentators has attempted to emphasize the passages which display Locke’s positive attitude toward hypotheses. Their view is that hypotheses have a pride of place in Lockean natural philosophy.¹¹

In some ways, my position can be understood as a middle ground between these two camps. I believe that the former group does not allow enough of a role for hypotheses and that the latter group overemphasizes their importance for Locke. My goal is to find an interpretation of Locke on hypotheses which acknowledges the mixed attitude in Locke’s texts but which nevertheless holds that his statements are consistent. What the above quotes make clear is that Locke was quite skeptical about the prospects for the useful employment of hypotheses in natural philosophy but also that he did not universally condemn their use;

⁸ *Some Thoughts Concerning Education* §180. Locke 1989, page 236.

⁹ Reprinted in Farr 1987, page 70.

¹⁰ See Yost 1951, Yolton 1970, Anstey 2002, Anstey 2003, Anstey, 2005, Anstey 2011, Walmsley 2003, de Pierris 2006, Winkler 2008, Domski 2012, and Ducheny *forthcoming*.

¹¹ See Mandelbaum 1964, Laudan 1967, Woolhouse 1971 Farr 1987, Soles 1985, Soles 2005, and Chibeni 2005.

Locke thought that some well-made hypotheses could be helpful. Given this, the most profitable way forward seems to be to ask what differentiates the very small number of good hypotheses from the very large number of bad ones. Put differently, which hypotheses did Locke think were “well-made” and why?

3. Five Criteria for a Good Hypothesis

My position is that to be well-made, and to be allowable in natural philosophy, Locke thought a hypothesis must meet five criteria:

- 1) It must be formed cautiously based on empirical observation
- 2) It must only employ terms with determined meanings
- 3) It must remain neutral on the nature of substance
- 4) It must not invoke a real essence
- 5) It must conform to all phenomena

These requirements are not mutually exclusive and many of the hypotheses which Locke encountered failed on more than one count. But failing to meet any one of these criteria is sufficient to make a hypothesis illegitimate for use in natural philosophy. My procedure in the remainder of this section will be to discuss each of these criteria in greater detail and show that Locke was indeed committed to each.¹²

The first criterion says that any valid hypothesis must be cautiously formed and must be based on empirical observations. The claim that, for Locke, any general statement must be based on careful observations of particular instances should hardly come as a surprise.

The insistence that general claims are posterior to and must be founded on particular claims

¹² It is important to mention that my goal here is not to explain *why* Locke was committed to each of these criteria, only to show that he was, in fact, committed to each. At some points I will mention the motives for Locke’s commitment, but that is not my primary goal.

is one of the most consistent themes of the *Essay*. The claim features prominently in Book I where Locke is trying to eradicate the notion that general claims are innate and ground knowledge of particulars.¹³ Locke returns explicitly to this point in the Book IV discussion of maxims.¹⁴ Here again he wants to highlight that it is knowledge of the particular propositions that precedes knowledge of a general proposition.¹⁵ But Locke does not conclude from this fact that general propositions are of no use. In fact, he explicitly affirms the contrary. He acknowledges that general propositions have an important role to play in our cognitive architecture.¹⁶ “For in particulars, our Knowledge begins, and so spreads it self, by degrees, to generals. Though afterwards the Mind takes quite the contrary course, and having drawn its Knowledge into as general Propositions as it can, makes those familiar to its Thoughts, an accustoms it self to have recourse to them, as the Standards of Truth and Falsehood.”¹⁷

So the idea of basing an hypothesis on observations of particulars is relatively straightforward, but what does it mean to form an hypothesis cautiously? The injunction to caution comes in two parts. First, a recommendation to gather, in good Baconian form, lots of data. It is only after a series of methodical experiments or observations that we should

¹³ See, in particular, 1.2.19.

¹⁴ 4.7.9-10.

¹⁵ Locke’s targets here are most likely the late Scholastics he read as a student at Oxford, though he may also have the Cartesians in mind.

¹⁶ Of course, it must be noted that in the chapter in question Locke does say that maxims have no role to play in the advancement of the sciences. But there is every reason to think that he has *maxims* in mind here and these are very different from *hypotheses*. The difference lies in the level of generality. The examples of maxims which Locke gives (‘what is, is’ and ‘the whole is bigger than the part’) seem very different and much more general than a properly formulated hypothesis in natural philosophy. What is important is that Locke thinks that general claims, properly formulated, can be useful.

¹⁷ 4.7.11.

endorse an hypothesis: “We should *not take up any one too hastily*... till we have well examined Particulars, and made several Experiments, in that thing which we would explain by our Hypothesis, and see whether it agree to them all.”¹⁸

Far more interesting is the second component of the injunction to caution. Locke recognizes a powerful tendency of the mind to overvalue hypotheses and treat them as absolute truths. “The Mind, that would always penetrate into the Causes of things, and have Principles to rest on, is very apt” to rush into an unfounded hypothesis.¹⁹ A cautious hypothesizer will be aware of this tendency and take steps to counteract it. We must never let hypotheses be taken as “unquestionable truths.”²⁰ Locke’s comments here suggest, but leave underdeveloped, a notion of revizability. The responsible natural philosopher will never become so wedded to a hypothesis that she is unwilling to abandon it when appropriate.

The second criterion for an acceptable hypothesis does not receive mention in 4.12.13 but comes up in the next section and is in line with another major theme of the *Essay*: no hypothesis should employ terms that do not have clear meanings. Consider the anecdote that Locke’s presents at 3.9.16.²¹ He reports having once been at a scientific meeting in which a

¹⁸ 4.12.13. The following note, from one of Locke’s journals, is also worth mentioning: “I am apt to impute many of the deficiency to be met with in their theories & reasonings of such great witts as Aristotle, Campanella & some other celebratd philosophers, chiefly to this thing that they hav so hastily & either upon a few observations, or at least without a competent number of experimts, presumd to Establish principles & deliver axioms.” Ms. Locke f. 14, page 23. The note is copied from Boyle’s *Certain Physiological Essays*.

¹⁹ 4.12.13. See also §6 of Locke’s *Of the Conduct the Understanding*, especially page 22 in Locke 1993 and Locke’s manuscript *De Arte Medica*: “[human understanding] is very inquisitive after their cause & [is] very restlesse & unquiet till in those things wch it is conversant about, it has framed to it self some hypothesis & laid a foundation whereon to establish all its reasonings.” Transcribed in Walmsley 1998, page 234.

²⁰ 4.12.13.

²¹ “I was once in a meeting of very learned and ingenious physicians, where by chance there arose a question, whether any liquor passed through the filaments of the nerves. The debate having been managed a good while, by variety of arguments on both sides, I (who had been used to suspect, that the greatest part of disputes were

fierce dispute was being waged about whether or not any liquor passed between the filaments of nerves. After watching the dispute for some time, Locke suggested to the relevant parties that perhaps they should pay more attention to the definition of the term “liquor.” Upon taking Locke’s advice the debaters discovered that they actually had no disagreement over the phenomenon in question; they were merely using the term “liquor” differently. Locke seemed to think that a great many of the disputes in natural philosophy could be solved in a similar way. Consider the famous Underlabourer passage where Locke claims science and knowledge could have advanced farther “*if the Endeavours of ingenious and industrious Men had not been much cumbred with the learned but frivolous use of uncouth, affected, or unintelligible Terms, introduced into the Sciences...*”²² He continues on to say that “*Vague and insignificant Forms of Speech, and Abuse of Language, have so long passed for Mysteries of Science; And hard or missapply’d Words, with little or no meaning, have, by Prescription, such a Right to be mistaken for deep Learning...*”²³ Thus, if any hypothesis was to be useful in natural philosophy it was necessary for it to use words that were both clear and consistent in their meanings. The reason for Locke’s insistence on this point is easily determined. Locke believed that the proper function of words was to express ideas. And the

more about the signification of words than a real difference in the conception of things) desired, that before they went any farther on in this dispute, they would first examine, and establish amongst them, what the word liquor signified. They at first were a little surprised at the proposal; and had they been persons less ingenious, they might perhaps have taken it for a very frivolous or extravagant one: Since there was no one there that thought not himself to understand very perfectly what the word liquor stood for; which I think too none of the most perplexed names of substances. However, they were pleased to comply with my motion, and upon examination found, that the signification of that word was not so settled and certain as they had all imagined; but that each of them made it a sign of a different complex idea. This made them perceive that the main of their dispute was about the signification of that term; and that they differed very little in their opinions, concerning some fluid and subtle matter, passing through the conduits of the nerves; though it was not so easy to agree whether it was to be called liquor or no, a thing which, when considered, they thought it not worth the contending about.”

²² *Epistle to the Reader.*

²³ *Epistle to the Reader.*

more precise and consistent a definition was, the more clear was the idea it represented. Any good hypothesis will have to reflect clear ideas in the mind of the hypothesizer; thus, any good hypothesis must employ good language.

Locke's remarks on mathematics are relevant here. Locke believed that mathematicians were extremely careful in their language, defining terms and sticking to those definitions. Further, Locke seemed to suggest that this is part of the reason for the enormous successes of mathematics. The section title of 4.12.16 says that mathematics is an instance of "clear and distinct ideas, with settled names." Contrasting mathematics with the debates of the Scholastics which required endless and pointless distinctions Locke writes that in mathematics "men have determined ideas with known names to them; and so, there being no room for equivocations, there is no need of distinctions."²⁴ To be sure, precision of language was not the only feature of mathematics that Locke appreciated, but nevertheless it was among its cardinal virtues.²⁵

Locke also held that the rigor of mathematics could serve as a model for other disciplines, including those of the natural sciences. In a letter to William Molyneux Locke says "I find none so fit nor so fair judges as those whose minds the study of mathematics has open'd, and disintangl'd from the cheat of words, which has too great an influence in all the others which go for Sciences: And I think (were it not for the doubtful and fallacious use

²⁴ *Of the Conduct* §30. Locke 1993, page 94. See also *Of the Conduct* §40 where Locke suggests that mathematicians "[keep] to the same terms precisely annexed to the same ideas." Locke 1993, page 121.

²⁵ See also 3.11.6: "Where, if the mathematician speaks of a cube or globe of gold, or any other body, he has his clear settled idea which varies not..." and 4.3.19 where Locke explains why demonstrations in morality are more difficult than those in mathematics: "their names are of more uncertain signification, the precise collection of simple ideas they stand for not being so easily agreed on, and so the sign that is used for them in communication always, and in thinking often, does not steadily carry with it the same idea."

is made of those signs) might be made much more sciences than they are.”²⁶ Or consider 4.12.7: “But whether something like [finding proofs in mathematics], in respect of other ideas, as well as those of magnitude, may not in time be found out, I will not determine. This, I think, I may say, that if other ideas, that are the real as well as nominal essences of their species, were pursued in the way familiar to mathematicians, they would carry our thoughts farther, and with greater evidence and clearness, than possibly we are apt to imagine.” The usefulness of mathematical thinking for other domains is also a theme of Locke’s *Of the Conduct of the Understanding*.²⁷ So Locke clearly appreciated the type of abstract principles employed by mathematicians. Part of the reason for this was that they met the criterion of always employing terms with precise meanings. This will become relevant later when discussing Locke’s view of Newton’s mathematical physics.

The third constraint on a good hypothesis is that it will remain neutral with regard to the nature of substance. Lockean skepticism about substance is well known.²⁸ The most important point here is that our idea of substance will always be confused.²⁹ As such, it is dangerous to base a system of natural philosophy on anything that purports to be a complete idea of substance. Locke’s chief culprit in this regard is Descartes. Descartes, of course, held that extension constituted a complete idea of material substance. Locke, of course, believed this to be woefully inadequate, especially insofar as it leaves out the vital idea of solidity. Locke uses Descartes’ conflation of body and extension as a stock example of

²⁶ To Molynux, 29 December 1692. Locke 1976, volume 4, page 609.

²⁷ See Locke 1993, pages 26, 29-30, 33-34, and 94.

²⁸ See 2.12.6, 2.13.18-20, 2.23.2.

²⁹ 2.12.16.

ideational confusion or misuse of language throughout the *Essay*.³⁰ Significant for present purposes is the way in which Cartesian dogmatism about the nature of substance had negative effects for Cartesian science. The Cartesian conception of extension was central to Descartes' derivation of the laws of motion for bodies. And Locke believed that these laws proved deeply inadequate. But Descartes is not the only philosopher guilty of tarnishing natural philosophy by claiming to understand substance. The Scholastics also come in for abuse in virtue of purporting to understanding material substance.³¹ In general, the message is clear. A hypothesis should not purport to describe what a given substance *is*; rather, the goal should be to develop hypotheses about the powers or qualities of a substance.

The next way a hypothesis can fail is by invoking a real essence.³² Lockean real essences are the internal constitutions of bodies which possess the powers that give rise to their perceivable qualities.³³ But real essences are not and cannot be of use in the pursuit of natural philosophy. This is because, simply put, they are beyond the scope of our knowledge

³⁰ See, for example, 2.13.11-14, 3.10.6, 4.7.12-13. It is worth noting that Locke thinks Descartes made a similar mistake with mental substance. His conflation of mental substance with thinking led him to the false hypothesis (Locke's term) that humans are always thinking. See 2.1.10-19.

³¹ See, for example, Locke's dismissal of prime matter at 3.10.15. The same passage also shows that *materia prima* also fails to meet the second criterion outlined above. Sadly, but characteristically, Locke fails to properly engage with Scholasticism or develop complete Scholastic positions to attack. Indeed, he prefers to ridicule prime matter rather than seriously consider hylomorphism; consider his description of a university disputation: "I was had to a foddering of chopped hay or Logick forsooth; poore materia prima was canvassed cruelly, stripped of all the gay dresses of her formes and shewne naked to us, though I must confesse I had not eyes good enough to see her... The young Munks (which one would not guess by their lookes) are subtile people, and dispute as eagerly for materia prima, as if they were to make their diner on it..." To John Strachey[?], early January 1666[?]. Locke 1976, volume 1, pages 254-255.

³² The topic of real essences is, of course, closely related to the topic of the nature of substances in Locke. Nonetheless, I think there is enough difference between the kinds of errors Locke has in mind here to justify making this a separate category.

³³ 3.3.17: "The more 'rational Opinion' to have of real essences is that of "those, who look on all natural Things to have a real, but unknown Constitution of the insensible Parts, from which flow those sensible qualities, which serve to distinguish them one from another."

and are wholly unknown to us.³⁴ Given this, the focus of proper natural philosophy will have to be on *nominal* essences, which are constructed based on perceived qualities, and thus are empirically adequate. Locke's criticism of certain alchemists (philosophers by fire³⁵) is instructive in this regard: "if others, especially the Philosophers by fire, who pretend to it [a knowledge of real essences], had been so wary in their observations, and sincere in their reports, as those who call themselves Philosophers ought to have been, our acquaintance with the bodies here about us, and our insight into their Powers and Operations had been yet much greater."³⁶ Rather than presume to know the basic components of material objects, the correct tactic is to gather more observations. Locke also discusses people who make this error in a medical context. He writes that suppositions about the underlying causes of various diseases will be unhelpful "till we can discover how the natural functions of the body are performed, and by what alterations of the humours, of defects in the parts, they are hindered or disordered."³⁷ And because we do not yet understand the internal constitution of the body those who make positions about real essences are talking nonsense: "I fear the Galenists four humours, or the chemists' sal, sulphur, and mercury, or the late prevailing invention of acid and alkali, or whatever hereafter shall be substituted to these with new

³⁴ 3.3.18: "For it is the real Constitution of its insensible Parts, on which depend all those Properties of Colour, Weight, Fusibility, Fixedness, *etc.* which are to be found in it. Which Constitutions *we know not* and so having *no particular Idea* of, have no Name that is the Sign of it." Emphasis added.

³⁵ This term as used in the seventeenth century was ambiguous as between Rosicrucians and alchemists broadly construed. I think the point holds regardless of which Locke was referring to.

³⁶ 4.3.16. It is worth noting that Locke was not entirely ignorant of (al)chemical researches. See Meynell 1995 and Meynell 2002. Locke also owned a variety of (al)chemical works. Most importantly, he owned a copy of the *Theatrum Chemicum*, the standard alchemical compendium of the seventeenth century. Harrison and Laslett 1971, pages 69-70.

³⁷ To T. Molyneus, 20 January 1692/3. Locke 1976, volume 4, page 629.

applause, will, upon examination, be found to be but so many learned empty sounds.”³⁸ The claim is that hypotheses in medicine should be based on observed symptoms, not on naked assertions about the internal composition of the body.

The last criterion is in some ways the most important one. This criterion holds that any hypothesis must conform to all observed phenomenon.³⁹ Locke sometimes speaks as though failing to meet this requirement is the most egregious as well as the most common way for a hypothesis to fail. This criterion is also perhaps the most straightforward. In constructing hypotheses we must be sure they “will carry us quite through, and not be as inconsistent with one *Phenomenon* of Nature, as they seem to accommodate, and explain another.”⁴⁰ Again, Descartes’ physics and astronomy are guilty. For example, Descartes’ hypothesis that the planets move in vortices was thought by Locke to be incompatible with astronomical observations.⁴¹ Locke also thinks that many hypotheses in the medical realm are guilty of failing to conform with phenomena: “concerning general theories, that they are for the most part but a sort of waking dreams...this be, as you rightly observe, beginning at the wrong end, when men lay the foundation in their own phansies, and then endeavour to sute the phaenomena of diseases, and the cure of them, to those phansies.”⁴² Locke’s remarks

³⁸ To T. Molyneus, 20 January 1692/3. Locke 1976, volume 4, page 629.

³⁹ While this might sound so commonsensical as to be obvious today it was anything but in the 17th century. Most famously, Descartes was nonplussed by the fact that many experiments could be designed which failed to conform to his laws of motion.

⁴⁰ 4.12.13.

⁴¹ Locke understood Newton as demonstrating this conclusively in the *Principia*. This topic plays a major role in Locke’s review of the *Principia* in the *Bibliothèque Universelle*. See Axtell 1965, page 156 and Cohen 1992, page 342. See also Locke’s *Second Reply to Stillingfleet*: Locke 1823, volume 4, page 451. Locke here provides a citation to Book 2, Section 9 of the *Principia*, which deals with vortices. In particular, the section’s two scholia (the pieces of the section most intelligible to a non-mathematician) suggest that motion of planets in vortices is mathematically impossible.

⁴² To T Molyneux, 20 January 1692/3. Locke 1976, volume 4, page 628.

on cognition in non-human animals give a final example of a hypothesis which fails this fifth criterion. Locke wrote to Anthony Collins that “Men of Mr N[orris]’s way seem to me to decree rather than to argue. They *against all evidence* of sense and reason decree Brutes to be machins onely because their *hypothesis* requires it...”⁴³ Locke claims that this hypothesis failed because it was incompatible with clearly observable phenomena: “...they must needs have a penetrating sight, who can certainly see, that I think, when I cannot perceive it my self, and when I declare, that I do not; and yet can see, that Dogs or Elephants do not thing, when they give all the demonstration of it imaginable, except only telling us, that they do so.”⁴⁴

Locke’s position on what makes a hypothesis adequate should now be relatively clear. The picture that emerges is more or less what one would expect given Locke’s scientific milieu. Each criterion outlined above had a place in empirical seventeenth century British natural philosophy. We can see the exhortation to caution in a letter written by William Croune (the first Registrar of the Royal Society) to Power in 1661. He claimed that the experimenters in London “believe that to make any Hypothesis, & publickly own it, must be after the triall of so many Expmts as cannot be made but in a long tract of time.”⁴⁵ Edmund King seems to make good on Croune’s claim when he writes in the *Philosophical Transactions* that he “iterated experiments over and over” before he was willing to discuss

⁴³ To Anthony Collins, 21 March 1704. Locke 1976, volume 8, page 254. Emphasis added.

⁴⁴ 2.1.19. Also relevant is 2.11.11: “For if [animals] have have any *Ideas* at all, and are not bare Machins (as some would have them) we cannot deny them to have some Reason. It seems as evident to me, that they do some of them in certain Instance reason, as that they have sence...”

⁴⁵ Cited by Shapin and Schaffer 1989, page 330.

his theory with others.⁴⁶ Locke's concerns about language hearken back to Bacon's Idols of the Marketplace and share an affinity with the claims of Sprat and Oldenburg. And his praise of mathematics is echoed by St George Ashe, who claimed that mathematics was excellent in part because the "ideas we form thereof are clear and distinct...because it makes use of terms which are proper, adaequate, and unchangeable" and because "it rejects all trifling in words and rhetorical schemes..."⁴⁷ Francis Hauksbee agreed that the fifth criterion was among the most important. Writing in *Philosophical Transactions* he claimed that "the greatest Satisfaction and Demonstration that can be given for the Credit of any Hypothesis, is, That the Experiments made to prove the same, agree with it in all Respects, without force."⁴⁸

Boyle's manuscript notes on the "Requisites of a Good Hypothesis" read as follows:

1. That it be Intelligible.
2. That it Contain nothing Impossible or manifestly False.
3. That it Suppose not any thing tht is either Unintelligible, Impossible or Absurd.
4. That it be Consistent with it self.
5. That it be fit & Sufficient to Explicate the *Phaenomena*, especially the Chief.
6. That it be at lest Consistent with the rest of the *Phaenomena* it particularly relates to, & do not contradict any other known Phaenomena of nature, or manifest Physical Truth.⁴⁹

I take it that 1-4 in Boyle's list correspond closely with what I have identified as Locke's second criterion: the need for clear and determined language in the formulation of

⁴⁶ King 1666, page 317. Consider also William Molyneux's frustration with those who proceeded incautiously: "And I wonder indeed that ingenious men will venture to offer anything to the learned world in practical matters, especially in such great undertakings as what we now consider, before they have made trials of what they propose." The quote is from Molyneux's "Remarks on Monsr. Hautefeuille's Method for Shortening Telescopes" (c. 1698) transcribed in Hoppen 2008, volume 1, pages 393-397.

⁴⁷ The quote is from Ashe's "Of Mathematics and a New Method of Demonstration" (1684) transcribed in Hoppen 2008, volume 1, page 126.

⁴⁸ Hauksbee 1707, page 2415.

⁴⁹ Boyle 1979, page 119.

hypotheses. And that 5 and 6 in Boyle's list correspond to the fifth Lockean desideratum: correspondence to phenomena.

4. Methodology

Now that Locke's position on hypotheses is clear I want to apply it to a problem about methodology. Some have argued that Locke was committed to the constructions of natural histories as the only appropriate way to proceed in natural philosophy. But Locke also has the highest praise for Newton and Newton's *Principia Mathematica*, which is a scientific book, but clearly not a natural history. Thus, some have thought there is a tension in Locke between his commitment to natural history and his embrace of a non-natural historical methodology in natural philosophy.

Before continuing it will be worthwhile to say a bit about what exactly the two methodologies are. Mary Domski has provided a helpful characterization: "The [natural historian] takes a "bottom-up" approach to nature and uses sense data to fashion a more complete idea of body by reference to the qualities and properties gathered from observation and experiment. In contrast, the speculative naturalist, on the other hand, takes a "top-down" approach to nature and beings with laws and principles, which rest on observational data collected by the practical naturalist, and then applies these laws and principles to other areas of nature."⁵⁰ So while the natural historian meticulously avoids hypotheses and inductive generalizations in the pursuit of facts and particular observations, the speculative practitioner allows herself various general principles to organize findings, develop theories, and prompt further research.

⁵⁰ Domski 2012, page 51.

Kenneth Winkler is one who recognizes that Locke was seriously impressed with Newton's accomplishment in the *Principia* but who finds that this is at odds with the fact that the *Essay* has a stringent commitment to natural historical methods.⁵¹ Winkler makes it the goal of his paper to show that “*in spite of* this natural-historical emphasis, Locke provides a way of interpreting—and defending—a mathematical physics.”⁵² He contends that Locke was able to make “*a separate place* for Newton, or for a physics of Newton's kind.”⁵³ The idea is that Locke was sufficiently impressed by what he understood of the *Principia* that he made changes to later versions of the *Essay* to accommodate this “distinctively Newtonian achievement.”⁵⁴

Domski begins with the same puzzle as Winkler. Namely, she wants to know how it is that Locke could reconcile his admiration for Newtonian methodology with his strong commitment to natural historical methods.⁵⁵ Domski takes exception to Winkler's claim that Locke embraced wholesale a form of mathematical physics. According to her, this would run counter to “Locke's career-long advocacy of natural historical methods for natural philosophy in the *Essay*.”⁵⁶ Her claim is that Locke's embrace of Newton and mathematical methods was carefully circumscribed. Newtonian methodologies were acceptable in sub-disciplines like astronomy in which the objects of study could only be observed, not

⁵¹ Winkler, 2008, pages 231-2: Winkler notes “a striking fact about Locke's *Essay*: its primary image of what was then called natural philosophy—the image that dominates its pages and is most easily recalled after the book is returned to the shelf—is natural-historical rather than mathematical.”

⁵² Winkler, 2008, page 232, emphasis added.

⁵³ Winkler, 2008, page 233, emphasis added.

⁵⁴ Winkler, 2008, page 250.

⁵⁵ Domski, 2012.

⁵⁶ Domski 2012, page 50.

manipulated and experimented on. But for more terrestrial investigations, in which the objects of study were available for experimentation and direct observation, mathematical methods would be improper and natural historical ones should be employed. So there is no tension because while Locke did embrace contrasting methodologies he embraced them for different domains.

While there is much to be admired in both of these papers and while I think that both capture important truths, I cannot fully endorse either of them. With regard to Winkler, I am in agreement with Domski. Winkler does point to pieces of Newtonian methodology and show their affinity with pieces of Locke's system, but he never succeeds in resolving the tension and thus leaves Locke with an awkward and unprincipled bifurcation in his methodology. With regard to Domski's solution I have two main complaints. The first is that Locke never explicitly recognizes a distinction between observation and experimentation. The ability to actually interact with and manipulate objects is never discussed as a relevant feature when deciding which methodology to employ. On the contrary, Locke suggests that the two are equivalent. In *Of the Conduct of the Understanding*, Locke writes that "facts are of three sorts; 1. Meerly of natural agents observable in the ordinary operations of bodys on one another, whether in the visible course of things left to themselves, or in experiments made by men, applying agents and patients to one another, after a peculiar and artificial manner."⁵⁷ Here Locke seems to explicitly suggest that experiments and observations are the same type of fact and therefore should play the same role in our cognitive reasoning.⁵⁸ The second objection I have to Domski's view is that

⁵⁷ *Of the Conduct*, §23. Locke 1993, pages 72-3.

⁵⁸ One could also add here that a contrast between experimentation and observation does not track the practice of science as Locke would probably have known it. Many natural histories were based solely on observation

it seems to saddle Locke with a deep misunderstanding of the *Principia*. If Locke thought that Newton's methodology was only good for astronomy then it seems he would have failed to appreciate the *universality* of universal gravitation. Presumably, one of the triumphs of the *Principia* was its unification of terrestrial and astronomical phenomena; the gravitational forces experienced by bodies here below were the same as the gravitation forces experienced by planets. If Locke understood the *Principia* as only discussing the solar system, then he seriously misunderstood the book.⁵⁹

As previously stated my goal is to offer an alternate theory about Locke's acceptance of both Newtonian and natural historical methods. More importantly, my goal is to demonstrate that there would have been no tension in accepting both methods. I shall argue understanding Locke's position on hypotheses makes sense of how and why Locke embraced both of these methodologies without tension or contradiction. Once we understood that Locke embraced some hypotheses we will understand that he did not conceive of natural history as *constitutive* of natural philosophy. Rather, he understood it as an integral but incomplete part of natural philosophy. His position was that there was also room for some more constructive, speculative natural philosophy.

But what of Locke's commitment to Newton specifically? Was Newton the sort of natural philosopher Locke could endorse without contradiction? My position is that Locke could endorse Newtonian science precisely because the hypotheses advanced by Newton

without reference to manipulation of objects or experimentation. And many experiments (particularly pendulum experiments) were designed to aid astronomical investigations.

⁵⁹ And there is some evidence that Locke did understand it as being about more than astronomy. Locke's comments to Stillingfleet about gravitation suggest that he took it to be relevant to *all* matter, not just to celestial bodies. See Locke 1823, volume 4, page 467.

conformed to the standards outlined above. In the next few paragraphs I will briefly illustrate why I think that this is so.

With regard to the second criterion, does Newton only employ terms with determined meanings? I think that the answer is yes. After all, the *Principia* is about the *mathematical* principles of natural philosophy. It is largely an exercise in the construction of geometric models. As such, the *Principia* begins with a list of 8 straightforward definitions and proceeds methodically from there. Locke often praises Newton qua mathematician.⁶⁰ Of course, mathematics was the paragon of demonstrative certainty in the seventeenth century, as well as Locke's example of demonstrative certainty at 4.2.2. But as I suggested earlier, some of Locke's admiration for mathematics can be explained by the fact that mathematicians operate with clear definitions and unconfused ideas. As Locke says about the ideational foundations for Newton's mathematics, "some of the incomparable Mr. Newton's wonderful demonstrations...were all founded in nothing but several ideas of quantity."⁶¹ So I think it fair to conclude that Newton was not guilty of forming hypotheses with confused ideas or imprecise terms.

With regard to the third and fourth criteria Newton also fares well. Newton was a deflationist about substances and avoided talk of real essences. The *De Gravitatione* attacks on Cartesian notions of substance as well as the positive account of substance which deflates it to a collection of perceivable qualities would have met with approval from Locke.⁶² Even more telling is Newton's debate with Hooke about the nature of light. In these disputes

⁶⁰ 4.1.9; 4.7.11; Locke 1823, volume 4, pages 55, 427.

⁶¹ Locke 1823, volume 4, page 55.

⁶² And there is some evidence that Locke knew of and approved Newton's deflationist views about substance. See Remnant and Bennett 1978. See also the provocative position in Bennett 2005 (especially Sections L, M, and N).

Newton continually insisted that his hypotheses were silent about the substantial nature of light. The idea that Newton avoided discussion of real essences also gains support from his silence on the issue of what *causes* gravitation attraction. While he entertained various hypotheses (the aether, electricity, etc.) he never felt that any was sufficiently well-grounded to endorse. Put differently, he never posited a real essence or internal constitution of bodies that would explain their mutual attraction. So with regard to metaphysical humility Newton would pass muster.

As for the first and fifth criteria I shall let Newton speak for himself:

As in mathematics, so in natural philosophy, the investigation of difficult things by the method of analysis, ought ever to precede the method of composition. This analysis consists in making experiments and observations, and in drawing general conclusions from them by induction, and admitting of no objections against the conclusions, but such as are taken from experiments, or other certain truths...And if no exception occurs from phenomena, the conclusion may be pronounced generally. But if at any time afterwards any exception shall occur from experiments, it may then being to be pronounced with such exceptions as occur.⁶³

Amidst the mathematics of the *Principia* lies a huge amount of observational data. And just as his astronomical work was predicated on observation his optical work and alchemical work were predicated on rigorous experimentation.⁶⁴ So I think we can conclude that Locke

⁶³ Newton 2004, page 139. This passage would not have been available to Locke as it was published after his death, but I think it is of a piece with Newton's other methodological statements. Westfall 1983, page 242 provides a similar quotation: "For the best and safest method of philosophizing seems to be, first to enquire diligently into the properties of things, and to establish those properties by experiments and then to proceed more slowly to hypotheses for the explanation of them. For hypotheses should be employed only in explaining the properties of things, but not assumed in determining them; unless so far as they may furnish experiments. For if the possibility of hypotheses is to be the test of the truth and reality of things, I see not how certainty can be obtained in any science; since numerous hypotheses may be devised, which shall seem to overcome new difficulties. Hence it has been here thought necessary to lay aside all hypotheses, as foreign to the purpose..."

⁶⁴ Newton's *Opticks* was not published until 1704, too late to have any effect on the *Essay*. But the substantial experiments and conclusions of the *Opticks* had been completed far earlier and Locke would have been familiar with Newton's optical works from papers read at the Royal Society or published in the Society's *Philosophical Transactions*.

would have embraced the Newtonian project because Newton met the requirements for sound hypothesizing.

Before moving on to say a bit more about natural history I want to say a little about Huygens. I think the case of Huygens is interesting for two reasons. First, I think the case of Huygens provides further counsel against regarding Locke as solely a natural historian. Second, I think it counsels us against reading Locke's endorsement of Newton as *ad hoc*, as exceptional, or as unique. Huygens is the most neglected of the quartet that forms Locke's list of "master-builders." Much well-known work has been done on Locke and Newton and on Locke and Boyle. And a fair amount of work has been done on Locke and Sydenham.⁶⁵ But there has been no significant scholarship on Locke and Huygens. I take it as a virtue of the theory of Lockean science that I develop in this chapter that it can explain what it was that Locke would have appreciated in all four of these figures. Huygens, both in his astronomy and in his optics, was characteristic proponent of hypotheses.⁶⁶ Any interpretation of Locke which has him rejecting hypotheses or adhering only to natural histories will have trouble explaining Locke's admiration for Huygens. More importantly, Huygens was a refugee from Cartesianism.⁶⁷ He came to shun the injection of metaphysics into natural philosophy in the same way that Locke and Newton did.⁶⁸ And like Newton, Huygens would have enjoyed the terminological rigor that came from the use of mathematics in physics.

⁶⁵ See, for example, Romanell 1984 and Sanchez-Gonzales 1990.

⁶⁶ Smith 2002, page 139.

⁶⁷ Stein 1990, especially pages 18-20.

⁶⁸ Of course, one might claim that one should not read Locke's methodological commitments off of the list of master-builders. Perhaps Locke was merely trying to list famous scientists of the day. I have some sympathy for this view but do think that the methodological affinity (and metaphysical humility) present among these four is striking. Even if the three British scientists can be explained by Locke's personal connection to them there is still the question of Huygens. Why include Huygens over Rohault, or Thomas White, or Leibniz?

Given all this, I think we can count Huygens as another example of a hypothesizer of whom Locke approved.

One might, at this point, object that I have pushed Locke too far in the speculative direction. Why, if Locke was willing to endorse hypotheses, was he still such a proponent of the natural history tradition? In short, I think he would have been attracted to it for the very same reasons he was attracted to Newton's project: metaphysical humility and empirical rigor. Focusing only on observable properties and qualities means avoiding commitments to substances or to real essences. And this rejection of metaphysics makes it far easier to employ determinate terms and ideas. And there can be no question of ignoring phenomena or failing to employ caution among natural historians. Their observations of phenomena are integral to the practice of good science and to the hypothetical inductive method. After all, Newton's *Principia* would have been impossible without Flamsteed's meticulous observations.

Another reason for supporting natural history in addition to the method of hypotheses might be that the latter method is far more difficult than the compilation of natural histories. This is precisely what made Huygen's "great" and Newton "incomparable." Locke may have also have thought that the prospects for constructing suitable hypotheses in some domains were much grimmer than they were in astronomy. For example, geology and medicine (not to mention something as complex as ichthyology) present phenomena that are both more numerous and more varied than those in astronomy. This means that creating general statements about their subject matter will prove far more difficult. My position is that Locke would have accepted a mathematical or hypothetical method in geology, had one been forthcoming, but that he was pessimistic with regard to the likelihood that a Newton of rocks

would come on to the scene.⁶⁹ This is why there is no tension between Locke's embrace of Newton's methods and his embrace of natural history.⁷⁰

Locke may also have been attracted to natural history for pragmatic ends as well. Even if he thought it would not advance scientific knowledge or even always provide grounds for judgment, he might have thought that it was still useful. At 4.12.10 Locke writes that even if we are only able to "reach very little general knowledge concerning the species of bodies, and their several properties" from experimentation we are still able to "draw advantages of ease and health, and thereby increase our stock of conveniences for this life." Put differently, it is useful to know that manure spread over a field will increase crop production and salt spread over a field will kill a crop. Even if one does not know precisely which chemicals are responsible for helping the plants to grow or at what stage of plant gestation they play an important role, one's belly will still be fuller for having paid attention to which substances are good for plants.

Before concluding I want to offer one more reason for rejecting any position which seeks to find a tension in Locke's embrace of both natural historical methods and more speculative methods which employ hypotheses. I think that examining Locke's criteria for an adequate hypothesis provides an interesting insight into what I find to be part of the motivating force behind his philosophy of science. Locke's project in the *Essay* is not wholly a positive one. The epistemological, metaphysical, and methodological villains of the

⁶⁹ Locke writes that "if others could give us so good and clear an account of other parts of nature, as [Newton] has of this our planetary world . . . we might in time hope to be furnished with more true and certain knowledge in several parts of this stupendous machine." Locke 1823, volume 3, page 248.

⁷⁰ It is worth noting that Newton himself may have not been entirely univocal with regard to method. His alchemical experiments look a lot like the kinds of investigations of metals that Locke recommends in the *Essay*. But, of course, the way in which Newton understood his alchemical investigations is a matter of debate.

entire *Essay* are the Cartesians and the Scholastics.⁷¹ Given this, it is hardly surprising that his philosophy of science can be read as explicitly anti-Cartesian and anti-Scholastic. Further, Locke was, by training and vocation, a physician and it is clear that his thinking on medical matters played a critical role in the development of his thinking about natural philosophy. Given this, we can fairly conclude that his philosophy of science was also carefully constructed to counter the Galenists, Paracelsians, and other practitioners of medicine of whom Locke disapproved.

So one important reason for rejecting a sharp dichotomy between more a speculative Newtonian methodology and a natural historical methodology is that such a dichotomy obscures Locke's larger goal of demanding empirical accountability in scientific practice. There is significant reason to think that the natural historians and the more speculative Newtonians were united in their firm opposition to Scholastic, Cartesian, and other "non-empirical" scientific practice. And insofar as this was the case, Locke was supportive of both.

5. Conclusion

In this chapter I have argued that Locke had clear standards for hypotheses in natural philosophy. Understanding this shows that Locke had a nuanced approach toward hypotheses: he neither accepted nor rejected them wholesale. Understanding these standards also lets us understand why Locke accepted both natural history and Newtonian physics as appropriate scientific methodologies.

⁷¹ This sentence is, of course, an over-generalization and ignores many subtleties as well as some minor villains (religious enthusiasts, hard-line monarchists, etc.)

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