

LOST IN THE LABYRINTH: SPINOZA, LEIBNIZ AND THE CONTINUUM

LOST IN THE LABYRINTH: SPINOZA, LEIBNIZ AND THE CONTINUUM

By

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A Thesis

Submitted to the School of Graduate Studies

In Partial Fulfillment of the Requirements

For the Degree

Master of Arts

McMaster University

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MASTER OF ARTS (2006) McMaster University
(Philosophy) Hamilton, Ontario

TITLE: Lost in the Labyrinth: Spinoza, Leibniz and the
Continuum

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University)

SUPERVISOR: Professor Richard Arthur

NUMBER OF PAGES: vi, 110

Abstract

In this thesis, I address the extent of Spinoza's influence on the development of Leibniz's response to the continuum problem, with particular emphasis on his relational philosophy of time and space. I expend the first chapter carefully reconstructing Spinoza's position on infinity and time. We see that Spinoza developed a threefold definition of infinity to explain the difference between active substance and its passive modes. Spinoza advances a syncategorematic interpretation of infinity, and founds a causal theory of time directly on this conception of infinity. In the second chapter, I examine the changes Leibniz's understanding of the continuum problem underwent during 1676 and immediately thereafter. During this period, Leibniz interacted extensively with Spinoza's ideas. We see that several fundamental features of Leibniz's philosophy of time take shape at this time. Leibniz adopts a Spinozistic definition of divine eternity and immensity, he reevaluates several analogies in an attempt to understand how the attributes of a substance interrelate, and he develops the notion of the law of the series that will become an essential feature of monadic appetite. Leibniz synthesizes several of these discoveries into a first philosophy of motion. The new understanding of motion leads Leibniz to rehabilitate substantial forms in 1678. Leibniz maintains that Spinoza's substance monism can be refuted only if there is a principle of activity within every individual in the universe. He attacks Descartes' and the Occasionalists' philosophies as systems equivalent to Spinozism. While Spinoza's philosophy is far from the only reason that Leibniz invents monadic appetite, his Spinoza studies clarify an important aspect of this decision and inform several other concepts in his mature philosophy of time and space. The thesis makes two contributions to recent scholarship: first, it explains a difficult and essential aspect of Spinoza's philosophy; second, it improves our understanding of Leibniz's labyrinthine development.

Acknowledgements

My thesis has benefited enormously from Dr. Richard Arthur's supervision. He has been a constant source of inspiration and information. His classes provided me with much needed background information; his comments and criticisms of earlier drafts have greatly improved my argument; and certainly not least, his research has informed every page of this thesis.

I would also like to thank my other readers, who had the unenviable task of sorting through my personal labyrinth. I would especially like to thank Michael Volek for his insightful comments on multiple drafts of the essay.

I would like to thank Daniel Farr for the mental stimulation.

An earlier version of chapter one was presented at the Central Canada Seminar for the Study of Early Modern Philosophy in October 2005. My thanks to the attendants for listening carefully to my nervous presentation.

Finally, I'd like to thank my wife Leanne, a monad if I've ever met one.

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List of Abbreviations

- DSR *De Summa Rerum: Metaphysical Papers, 1675-1676*, ed., trans. G. Parkinson. (Yale UP, 1992).
- L *Gottfried Wilhelm Leibniz: Philosophical Papers and Letters*, 2nd Edition, ed., trans., Leroy E Loemker. (Chicago UP, 1969).
- LoC *The Labyrinth of the Continuum: Writings on the Continuum Problem, 1672-1686*, ed., trans. Richard T. W. Arthur. (Yale UP, 2001).
- NEHU *New Essays on Human Understanding*, ed., trans, P. Remnant and J. Bennett. (Cambridge UP, 1996).
- WF *G. W. Leibniz: Philosophical Texts*, ed., trans., R. S. Woolhouse and R. Franks. (Oxford UP, 1998).

I. Introduction

The relationship between Leibniz and Spinoza has intrigued philosophers for centuries. Their metaphysics exhibit a strange parity even on points where they disagree. Leibniz's monads oppose Spinoza's substance so purely, it sometimes looks as though the men were responding to exactly the same question, using the same set of restrictions. We should not dismiss this as merely a sign of the times: neither Descartes' dualism nor Hobbes' materialism answer the question with such a perfect example of Hegelian antithesis. The debate over Spinoza's influence on Leibniz is heavily colored by this antithesis, and it seems more acrimonious than the question of, say, Hobbes' influence on Leibniz. In the latter case, disputes tend to focus on details and extent, whereas in the former often have a categorical flavor: Yes, Spinoza was the essential influence! No, Spinoza offered Leibniz nothing at all!¹ Leibniz's own writings reveal the same ambivalence. He derides and dismisses Spinoza as an inconsequential thinker, but frequently reveals his fascination with the "discerning Jew."

The controversy over Leibniz's debt to Spinoza began with his earliest critics. In 1714, Louis Bourguet sent Leibniz a letter in which he argues that Spinozistic consequences follow from Leibniz's principles. He claims that because all possibles exist, there is no difference between a possible world and the best possible world. Our world exists; therefore it is the best of all possible worlds. This world is completely determined by God; in it, there is no metaphysical evil. When Leibniz responds, he carefully explains how his position differs from the Spinozistic one Bourguet ascribes to him. He maintains that only the monads adequately respond to Spinoza's monism: "according to Spinoza, there is only one substance. He would be right if there were no monads" (L 663). A monad consists in a principle of change and the manifold perceptions that principle produces. The monad manifests its perceptions in the changes its body undergoes. Leibniz contends that if an individual lacks its own principle of activity, it cannot be self-identical. Since bodies lack a principle of activity, they

¹ This is not to say that more detailed stories are not being told. Parkinson, Kulstad and Laerke have all written careful studies of certain aspects of Leibniz's relationship with Spinoza.

are only passive modifications of substances without a unity of their own. Bourguet discovers Spinozism in Leibniz's metaphysics because Bourguet refuses to endow every entity with both appetition and perception.² Leibniz replies that this is a caricature of the monadology.

In his recent *The Courtier and the Heretic*, Matthew Stewart points out the oddity of Leibniz's assertion. Leibniz does not tell Bourguet that monads are the best response to Spinoza; he tells him they are the *only* response to Spinoza. This seems bizarre because Leibniz publicly acknowledges his debt to Aristotle's and Descartes' insights, but almost never praises anything found in Spinoza's writings. So why does he consider his monads the only refutation of Spinoza's metaphysics? Does Spinoza's philosophy exceed two of the most prominent sources of Leibniz's monadology? Stewart offers a categorical answer to this question: "the meeting with Spinoza was the defining event of Leibniz's life" (2006: 15). He argues that Leibniz's encounter with Spinoza provided him with both the problem central to his philosophy and a major obstacle to any response to that problem.

Of course, it seems natural for Leibniz to respond that his system refutes Spinozism where others do not, especially when Bourguet's argument more or less repeats his own objections to the alternative systems. From 1677 on, he consistently deduces Spinozism from Descartes' belief that matter eventually undergoes every possible variation. As we will see, he argues that neither Descartes nor the Occasionalists have an adequate understanding of motion, because their commitment to the conservation of quantity of motion implies that only the whole universe really moves. Because all motion is relative, the motion of one individual body cannot cause the motion of another. In some frame of reference, the causal sequence is reversed. Through monadic appetition, Leibniz replaces the conservation of motion with the conservation of force. He thereby restores causal efficacy to individual minds and eliminates the need for an extended God.

² Perhaps he follows the Cartesians in positing unperceiving material bodies as entities independent of the minds that have them.

Leibniz's reaction to Bourguet shows that he was well aware of the potential threat Spinozism posed to his system. However, his interaction with Spinoza's ideas hardly proves that Spinoza was the decisive influence on Leibniz's development. Leibniz was lost in the labyrinth of the continuum long before he rediscovered Spinoza in 1676. By then, he had devoted considerable energy to the questions and paradoxes surrounding substance, infinity, matter, motion and time. He explored multiple solutions to these problems, drawing on an enormous range of contemporary philosophers. As we shall see, Leibniz slowly developed the content and structure of his mature position after carefully studying a host of other systems. He culled components from each of them, and advanced multiple alternative arrangements to eliminate any inconsistencies between the various parts. He presented the final version as the correct synthesis of an enormous range of philosophies. Spinoza's notoriety alone ensured that Leibniz would forge his own philosophy at least partially in response to it. Stewart exaggerates the importance Spinoza's philosophy played in the emergence of Leibniz's metaphysics. Spinoza's vision provided only one thread in the mighty rope Leibniz weaved to guide him out of the maze.

Even in his extremity, Stewart stands in a long tradition. In his monumental work, *A Critical Exposition of the Philosophy of Leibniz*, Bertrand Russell reinvigorated the study of Leibniz by emphasizing the role of subject-predicate logic in the structure and content of Leibniz's metaphysics. Russell argued that Leibniz's philosophy follows if five premises are granted, but that the premises are inconsistent. To eliminate the contradictions in his system, Leibniz needed to adopt Spinoza's monism; however, he despised Spinoza's 'godless' philosophy and consciously sought to distance himself from it in all his writings. In the preface to the second edition, Russell pithily remarks, "Leibniz fell into Spinozism whenever he allowed himself to be logical" (1937: vii). He even accused Leibniz of promoting an esoteric Spinozist philosophy to philosophers while presenting an exoteric orthodox view to princesses and dukes.³

³ See his *History of Western Philosophy* chapter 11.

The dismissive tone of those who reduce Leibniz's complex metaphysics to poor imitation of Spinoza's *Ethics* provokes another group of critics to deny that Spinoza had any influence whatsoever on Leibniz's development. This group espouses an extremity of its own. For example, Friedman responds acidly to Stein's modest argument that Leibniz went through a Spinoza friendly period in 1677-9, even though Stein's error was very minor (we will see Leibniz's interest in Spinoza occurred in 1675-6). More recently, Robert Sleigh and Christa Mercer have argued that during his formative period, Leibniz did not know enough about Spinoza's philosophy to be influenced by it. Mercer believes that the similarities between Leibniz's and Spinoza's philosophies appear only because Spinoza's also resembles the Aristotelian and 'Platonist' metaphysical assumptions she believes governed Leibniz's thinking throughout his life.

Russell's and Mercer's analyses reveal the limitations of emphasizing exclusivity. Russell's evaluation of Leibniz lost credibility, not least because the discovery and publication of more and more of Leibniz's papers reveal a system even more complex and intricately connected than the one Russell discovered beneath the fantastic language of the *Monadology*.⁴ In "Russell's Conundrum" Arthur shows that Russell's attack on Leibniz's argument for monads fails because Leibniz does not accept several of the premises Russell identifies, most importantly that monads are actual parts of matter. In the same way, we will see that a closer look at some of Leibniz's writings also refutes Mercer's belief: Leibniz learned a great deal about Spinoza in 1676, and he tests out a hypothesis fundamentally opposed to the set assumptions Mercer attributes to him.

Neither Russell nor Mercer can locate *the* fundamental set of assumptions that determine the exact nature of Leibniz's mature philosophy, because he was not a philosopher devoted to absolutely first principles. His logician's mind loved

⁴ When Russell wrote *A Critical Exposition of the Philosophy of Leibniz*, he drew extensively on the *Discourse on Method* and his letters to Arnauld. He considered these documents essential to penetrate Leibniz's system, and lamented the fact that so few of them were available. In the second edition, he emphasized the new evidence for his position afforded by Couturat's 1903 *Opuscules et fragments inédits de Leibniz*. Since then, several volumes of Leibniz's notes have been published, including wonderful collections such as Loemker's *Philosophical Papers and Letters* and Arthur's *Labyrinth of the Continuum*. Unsurprisingly, the

to tackle the problems of infinite analysis, so he enthusiastically devoted himself to demonstrating one concept through another. Leibniz recalls his demonstration of the part-whole axiom with a neat statement of his passion: “We may learn from this that every proposition which is neither accidental (such as one based on experience) nor arbitrary (such as a definition) nor identical (such as the proposition that nothing can at the same time be and not be, that anything whatever is equal to itself, etc.) is demonstrable” (DSR 39). The virtuosity with which Leibniz derives one principle from another shows this commitment in action and undermines the image of Leibniz as a static philosopher working from a fixed set of metaphysical principles.

The emphasis on exclusivity diminishes our ability to recognize the more nuanced reactions that make up the bulk of the development of Leibniz’s philosophy. To avoid this danger, I suggest that we do not pose the problem of influence in terms of one philosopher’s system deriving from or collapsing into another. Instead, I approach the relationship between Leibniz and Spinoza more modestly. First, I carefully explain Spinoza’s understanding of infinity and time. Second, I isolate several individual concepts that link Leibniz’s philosophy to Spinoza’s. I concentrate on the impact Leibniz’s 1676 Spinoza studies had on the development of his philosophy of space and time. I describe how Leibniz reacted to Spinoza’s arguments and how he transformed some of Spinoza’s ideas into concepts useful for his own project..

In the first chapter, I examine the two key concepts in Spinoza’s substance monism: infinity and eternity. Spinoza’s response to the continuum problem revolves around his understanding of these terms. Drawing extensively on Spinoza’s *Ethics*, his “Letter on the Infinite” and letters to Oldenburg,⁵ I carefully reconstruct Spinoza’s ontology. We will see that the distinction between active substance and passive modes underlies Spinoza’s threefold division of infinity

more we learn about Leibniz’s arguments, the more we have to revise the interpretations written with limited access to the texts.

⁵ With the exception of Ep. 50 and the complete *Ethics*, Leibniz had access to all the primary sources I cite in my first chapter. He likely met the recipient of Ep. 50, Jarig Jelles, in The Hague since he and Schuller were among those who facilitated the publication of Spinoza’s posthumous works.

into the absolutely infinite, the infinite by virtue of its cause, and the infinite by virtue of exceeding any number.

Spinoza maintains that the absolutely infinite is self-causing. Substance exists by definition, and necessarily produces all its modes. Spinoza identifies both infinite and finite modes. The former are infinite by virtue of their cause. They exceed all limits, but they do so only by virtue of the absolutely infinite substance they express. The finite modes, on the other hand, exceed every number. While there are an infinity of finite modes within every attribute of God, God's attributes are indivisible. The modes are not distinct parts; instead, each mode consists in a harmonious relation within a certain region of an attribute. Spinoza argues that each region contains an infinity of other regions. He shares with Leibniz both the belief that the real world is actually infinitely divided and the syncategorematic interpretation of that infinite division. Like Leibniz, Spinoza contends that the categorematic conception of infinity leads to paradoxes and confusion.

Spinoza proclaims that a correct conception of infinity will dispose of the paradoxes of the infinite and provide a springboard to adequate or intuitive knowledge of the world. One of the earliest uses he makes of his conception of infinity is to argue against number and time. He claims that they are measures we derive by abstracting common elements from diverse sensory experiences. When we use them to compare finite modes to one another, they can explicate certain features of our universe; however, these measures always provoke confusion when we try to apply them to substance, and often introduce paradox into our understanding of finite modes when we forget that measures are only tools we apply to the study of nature, not real features of nature itself. Samuel Levey remarks on the “uncanny” correspondence between Spinoza's and Leibniz's routes out of the labyrinth of the continuum: both point to confusion between the measure and the thing measured as the source of numerous paradoxes. Spinoza believes that reality is continuous while measures are discrete; although his position is the opposite of Leibniz's, Levey insists that the relationship deserves further scrutiny. I take him up on his suggestion.

Spinoza posits a difference in kind between eternity, which describes substance, and duration, which describes finite modes. His definition of eternity parallels the absolutely infinite: eternal being is necessary being, absolutely unlimited. As Spinoza puts it, eternity is existence itself. Spinoza describes how our temporal experiences reveal the causal structure of *Natura naturata*. The length of time between two events depends on the number of causes that intervene between one event and the other. I argue that Spinoza's causal account of time derives directly from his definitions of infinity and eternity. Following Hardin, I promote space-time diagrams as useful tools to explain Spinoza's account of temporality.

Spinoza denies that a sempiternal definition of eternity adequately explains substance. 'Sempiternal' means 'everlasting'; it refers to something that exists at all times. Spinoza has two reasons for rejecting sempiternity. First, he contends that it requires succession, and therefore breaks substance into parts. Second, it implies the existence of a duration distinct from substance which can be used to measure it. This duration amounts to a second order of time. Space-time diagrams do not refer to any time not depicted in the diagram. They represent the entire universe in four dimensions; therefore it makes no more sense to say that they exist at all times than it does to say they exist in all places. Substance produces all times just as much as it produces all places – these 'things' (Spinoza would call them abstractions) appear within substance; they do not suffice to measure it. Substance is the activity that upholds duration. It exists by virtue of its own definition, whereas every enduring thing appears only as a result of substance. Thus, duration, even sempiternal duration, does not signify necessary existence. Spinoza claims that eternity is the only 'temporal' concept that applies to the real universe.

Finally, I argue that Spinoza's rejection of time does not amount to a rejection of change. Space-time diagrams only explain limited aspects of Spinoza's ontology. The dynamic force within it cannot be depicted in our diagram. I argue that *Natura naturans* determines all of the variations in *Natura naturata* without any change in either the essence of active nature or the character

of passive nature. I revisit Spinoza's account of modes, and use his definition of an individual to show how *Natura naturans* can be changeless even while change is a basic feature of *Natura naturata*. The space-time diagram represents the passive extended, rather than active extension. In his letter to Leibniz, Schuller calls Spinoza's extension 'immensity.'

In the second chapter, I examine the subtle changes Leibniz's thinking undergoes when he encounters Spinoza's philosophy during the last year of his stay in Paris. We have to proceed with some caution, for Leibniz's writings on the key elements that will develop into his theory of time are a patchwork of notes, letters, reflections and aborted projects. Some of them are complete; others trail off or were put aside for revision. Very few were ever prepared for publication. Many of them are written on the backs of other projects, on strips torn from other sheets, and sometimes on the backs of bills. They are littered with numerous marginal notations, cancellations and annotations (such as 'error'). Leibniz entertains and rejects hypotheses, only to return to them later; rehearses favorite arguments only to find them unsatisfactory; and reiterates the need for more careful demonstrations even after he has already provided them several times.⁶ Arthur describes (some of) them as "merely thinking on paper" (LoC xxv) and Parkinson refers to them as sketches and scribbles. There seem to be few positions he would not consider, and the mere presence of Spinoza's doctrines does not warrant the conclusion that Spinoza had any lasting impact on Leibniz's philosophy. We must carefully examine Leibniz's writings to see if we are to discern any Spinozistic convictions and, more importantly, which of his theories depend on these convictions. Sorting through this rhizome of writings is the task of the second chapter.

We will see that he began an intensive study of Spinoza's philosophy in 1676 that did not end until after he read the *Opera Posthuma* in 1678. During this period, Leibniz's response to the continuum problem underwent a radical revision. He articulated several new concepts that became central to his relational theory of space and time. Many of these arose out of his newly solidified

⁶ See, for example, the "Conspectus for a Little Book on the Elements of Physics."

syncategorematic understanding of infinity. We will see that he introduced a hierarchy of infinities and, on two occasions, identified it with the one espoused by Spinoza. As his acquaintance with Spinoza's philosophy grew, he adopted more Spinozistic definitions of the divine attributes encapsulated in the hierarchy. He began identifying divine immensity and eternity as the indivisible sources of real space and time.

Next, Leibniz deepened his understanding of the law of the infinite series through an examination of the relationships between divine attributes or essences. He analyzed a series of analogies in an attempt to answer the question, 'how can infinite variety follow from a single definition of an essence?' Towards the end of the year, his solution resembled Spinoza's substance monism. Tschirnhaus had already posed this question to Spinoza before he met Leibniz. He asked it again after he and Leibniz became friends, and included Leibniz's proposed solution. This indicates that Leibniz associated both the question and the answer with his study of Spinoza's philosophy.

When Leibniz synthesized the year's progress in a study of motion, he discovered that God's mind governs every motion in the universe, and that only the entire universe really moves. This occasionalist interpretation of motion corresponds with the substance monism he espouses in a paper written about the same time. As Leibniz began to rehabilitate the notion of substantial form, he modified his conception of motion slightly: rather than one substance upholding all the motion of bodies, Leibniz appeals to an infinite number of substances within each and every body. However, his argument for monads uses the same analogies to promote a related solution. Whereas he formerly held that infinite diversity follows from the relationships among God's infinite attributes, his mature position maintains that infinite diversity follows when God establishes a monad with its own diverse point of view in every part of matter however small. He subsequently argues that occasionalism collapses into Spinozism.

II. Spinoza on Infinity and Time

Spinoza's monism hinges on the concepts 'infinity' and 'eternity.' Both terms first appear in the sixth definition of the *Ethics*, where Spinoza declares,

“By God I mean an absolutely infinite being, that is, substance consisting of infinite attributes, each of which expresses eternal and infinite essence.” Since understanding the chief statement of Spinoza’s ontology requires a correct interpretation of these words, one would expect him to subject them to a detailed examination. But even though the whole *Ethics* is an explication and analysis of the definition’s implications, the two key concepts behind it receive very little attention. Nowhere in the *Ethics* does Spinoza define infinity, aside from brief comments to the effect that it involves no negation. While he does offer some explanation of eternity, his description of human immortality seems to fly in the face of his earlier provisions. Given these rather glaring omissions in Spinoza’s application of the geometrical method, how are we to judge some of the alleged consequences of the one substance doctrine? In particular, what does it mean to say that God is infinite and eternal, that time is a mere aid to the imagination, and that some aspects of the human mind are immortal? Further, how can an atemporal conception of the universe contain the dynamism Spinoza claims is inherent in extension?

In the *Ethics*, Spinoza sets out to teach humans how to live the rational life. While Spinoza derives his ethos from a carefully constructed ontology, his practical intentions often lead him to leave large areas of his metaphysics unstated.⁷ Infinity and eternity suffer from this preoccupation: Spinoza obscures his metaphysical doctrines by concentrating on the affective consequences of inadequate ideas. We see this clearly when we examine his philosophy of time. Problems provoked by aids to imagination dominate his discussion of time. Rather than defining time or relating it to his ontology, he explains the specific reactions that result from our emotions and passive interactions with the world.⁸ Hence, his philosophy of time is vague and full of apparent contradictions. But

⁷ In fact, it has been widely commented that Spinoza may not have wanted to be understood, at least not by his contemporaries, for fear that his radical beliefs would scare people away from the rational behavior he advocated.

⁸ In his “Spinoza on Duration, Time and Eternity,” David Savan describes this preoccupation beautifully: “Spinoza is concerned with time because it is basic to memory, recollection, doubt, hesitation, vacillation, the imagined contingency of the future, the imagined compulsion of the past, and the powerful passions connected with these inadequate ideas” (2001g: 370).

we should not take Spinoza's silence too seriously. Despite the sparse attention he devotes to time in the *Ethics*, he clearly expresses the skeleton of his position. We can flesh out this skeleton by examining his numerous letters to fellow philosophers. We will see that he expresses an elegant but complicated causal theory of time directly founded on his conception of infinity.

Few commentators examine the relationship between Spinoza's account of infinity and his philosophy of time. Most scholars concentrate on these concepts only in relation to his controversial statements about human immortality. They attempt to reconcile mind-body parallelism with the nonphysical endurance or eternity of the mind. While this sometimes leads to debates over the status of sempiternity in Spinoza's system, his critics rarely delve into the intricate connections between infinity and his temporal ontology. Hopefully we can redress some of this neglect in the current paper. To accomplish this task, I will weave together the network of scattered texts related to infinity and time: the letters containing his elaborations, answers to questions and responses to objections, his commentary on Descartes, and the arguments in the *Ethics*. Through careful exegetical work, we will discover how Spinoza's precise analysis of infinity and eternity informs a strict determinism and a causal structure to time. Understanding this relationship will occupy the bulk of the chapter. For the most part, I will ignore the usual discussions.⁹

1. Infinity

Spinoza writes his longest analysis of infinity in a letter to his friend Lodewijk Meyer. In "The Letter on the Infinite," he introduces three ways to classify infinity that will free it from the paradoxes it often involves. He exclaims:

To everyone the problem of the infinite has seemed very difficult, if not insoluble, precisely because they have not distinguished between that which is infinite as a consequence of its very nature or by the force of its definition, and that which has no limits not by the force of its own essence but by the force of its cause. And also because they have not distinguished between that which is called infinite because it has no limits,

⁹ For a summary of the discussion and an extensive bibliography, see Lee Rice "Mind Eternity in Spinoza."

and that whose parts cannot be expounded by or equated with any number, even though we know its maximum and minimum, i.e. that it is bounded. Finally, they have not distinguished between that which can only be understood and not imagined, and that which can also be imagined. (LoC 103)

These three distinctions are extremely useful tools for interpreting Spinoza's system. Unfortunately, he explains them in rather cryptic language. Spinoza feels no need to provide all the pertinent details, relying on Meyer's intimate familiarity with his metaphysics to fill in any gaps. Meyer wrote the preface to Spinoza's *Principles of Cartesian Philosophy*, where he indicated the differences between Spinoza's views and Descartes'. In order to understand the letter, we will need to approximate the mindset of the presumed audience. We will explore each distinction in turn, clarifying each by situating it within Spinoza's ontology.

A. The First Distinction

Early in the *Ethics* Spinoza proves that there can be only one substance, and therefore that God, substance, and nature are synonymous terms denoting the same entity. Spinoza divides nature into an active and a passive constituent: *Natura naturans* and *Natura naturata*, attributes and modes.¹⁰ The distinction between the absolutely infinite and the infinite by virtue of its cause rests on this foundation. 'Naturing' nature expresses the essence of substance (E1def6). Each attribute is a basic category necessary for an adequate conception of substance, a

¹⁰ Bennett dismisses the *Natura naturans* - *Natura naturata* distinction a little too readily. He writes, "In passing I should mention some technical terminology which has grabbed the attention of some readers of the *Ethics* and has been accorded an importance it does not have. It is quite without significance in the *Ethics*, and we need not linger on it" (1984: 118-9). Bennett's sole argument for his position is the limited use Spinoza makes of the specific words. He points out that they only appear one other time in the whole work, "in p31, which has no deductive progeny, and that use of it is dispensable" (1984: 119). However, when Spinoza explains the difference between *Natura naturans* and *Natura naturata* in E1P29S, he points out that the distinction is an ongoing and important feature of the *Ethics*: "Before I go any further, I wish to explain at this point what we must understand by '*Natura naturans*' and '*Natura naturata*' I should perhaps say not 'explain' but 'remind the reader,' for I consider that it is already clear from what has gone before that by '*Natura naturans*' we must understand that which is in itself and is conceived through itself; that is, the attributes of substance that express eternal and infinite essence...By '*Natura Naturata*' I understand all that follows from the necessity of God's nature...or all the modes of God's attributes insofar as they are considered as things which are in God and can neither be nor be conceived without God." In other words, Spinoza sees this distinction as running throughout the *Ethics* despite the fact that he does not often use the terminology. Since Bennett acknowledges the important difference between modes and attributes, I fail to see what he is rejecting here.

category that is both self-sufficient and self-explanatory. An attribute “is in itself and is conceived through itself;¹¹ that is, that the conception of which does not require the conception of another thing from which it has to be formed” (E1def3).¹² Spinoza calls the infinity of *Natura naturans* ‘absolute.’ Since substance exists necessarily or by definition, it is self-causing and self-sufficient. Thus it encounters absolutely no limitation to its existence.¹³ Bennett points out that Spinoza often equates this infinity with the word ‘all,’ indicating “a concept

¹¹ Leibniz finds Spinoza’s definitions unnecessarily opaque: “This definition is obscure. For what does ‘to be in itself’ mean? Then we must ask: Does he relate ‘to be in itself’ and ‘to be conceived through itself’ cumulatively or disjunctively? That is, does he mean that substance is what is in itself and also that substance is what is conceived through itself? Or does he mean that substance is that in which both occur together, that is, that substance is both in itself and conceived through itself?” (L 196). Evidently, Spinoza intends the latter. Even so, Leibniz remains unsatisfied, for he feels that one must first disprove the former.

¹² Strictly speaking, this definition applies to substance; but Spinoza himself defines ‘attribute’ in these words in Letters 2, 4 and 9. Using the same definition for the words makes sense, since an attribute is the essence of substance, and the essence of a thing is “that which, when granted, the thing is necessarily posited, and by the annulling of which the thing is necessarily annulled; or that without which the thing can neither be nor be conceived, and, vice versa, that which cannot be or be conceived without the thing” (E2def2). The essence of substance, then, is the very conception that allows us to think substance. However, an attributes is merely infinite after its kind, and so each expresses only one aspect of substance. This begins to explain why an absolutely infinite substance must have every attribute. For more on this idea, see page 19.

¹³ Leibniz objects that this sort of ontological proof only works if one first proves the possibility of the thing so defined. He relates that he demonstrated this point to Spinoza when the two met in The Hague: “I showed this reasoning to Mr. Spinoza when I was in the Hague. He thought it sound, for when he contradicted it at first, I put it in writing and gave him this paper” (L 168). Parkinson points out that it’s hard to see how an ontological argument building on divine necessity rather than divine perfection suffers from the same shortcomings. Parkinson argues that the closest thing to an examination of Spinoza’s version of the ontological argument appears in the “Secrets of the Sublime”, where Leibniz argues from the existence of things in the universe to the existence of a necessary being. The argument depends on the assumption that everything that exists must have a cause. He writes, “Leibniz argues that since something exists, and since everything has a cause, then there must exist a necessary being; but since a necessary being exists, then (arguing from *esse* to *posse*) such a being must be possible. Leibniz does not seem to have used this argument elsewhere; and indeed it would appear that, if valid, it is also superfluous. For Leibniz is in effect proposing to use the existence of a necessary being to prove that such a being is possible – so that he can prove that it exists” (DSR xx). The similarity between this argument and the one Leibniz praises at the end of Spinoza’s “Letter on the Infinite” stands out: surely for this cosmological background to the ontological argument to make sense, Leibniz must accept an argument against an infinite causal regress. But how odd, since he flirts with infinite number (and so with something that seems to turn against the argument) in the February note. The argument Parkinson reconstructs is found in a footnote to the essay, and it has an extremely provisional character – when was it added? Could it have been added in response to the introduction to Spinoza’s *Ethics* he writes at almost the same time?. For an argument that proving the possibility of the definition 6 occupies the first third of Book 1 of the *Ethics*, see Gilles Deleuze, *Expressionism in Philosophy*, chapter 4. Deleuze suggests that “We are left to conclude that Leibniz did not report the conversation at The Hague accurately” (1990: 78).

of infinity that is...an elevated version of the concept of totality, the whole, nothing omitted” (1984: 76).¹⁴ Spinoza’s absolutely infinite is the active force that generates the entire universe.

‘Natured’ nature is the generated universe, something that we can understand only through an analysis of active nature. *Natura naturata* is a modification of, or a way that, *Natura naturans* exists: substance instantiated in modes, the limited forms in which substance interacts with itself. A mode is an “affection of substance, that is, that which is in something else and conceived through something else” (E1def5). Modes cannot exist without the thing of which they are a modification – they are essentially dependent. But this dependence does not necessarily render them finite. In fact, the principal elements of *Natura naturata* are infinite, but infinite in a sense conditional on the absolute infinity of *Natura naturans*. Spinoza introduces the immediate and mediate infinite modes at E1P21 and 22. He argues that anything produced directly by an essence of God will be infinite, and everything produced directly by one of these things will also be infinite.¹⁵ These infinite modes are infinite only by the force of their cause; they owe their existence to something else.

An example will help clarify Spinoza’s position. “Extension is an attribute of God; i.e., God is an extended thing” (E2P1). It is difficult to say what,

¹⁴ In his attempt to re-construct the pre-geometric *Ethics*, Wolfson appeals to ancient sources that he believes inform Spinoza’s conceptions. He claims that the infinite is a special type of negation, absolute negation, that permanently forecloses on any definite description of the X called ‘infinite’: “It means that substance whose essence is unique and so incomparable that it cannot suffer any form of limitation and hence cannot have any positive description, for every description implies limitation, or as Spinoza puts it: ‘determination is negation’” (1934: 134). He argues that we require a standard measure in order to compare one thing with another. Since the infinite exceeds all such standards, any attempt to contrast it with a finite thing or determine it in any way will limit it and betray its essence. Wolfson’s account emphasizes the radical difference the finite and the infinite, but he overstates his case. He implies that we cannot know substance, since we can determine nothing about it. However, the phrase “determination is negation” appears in Letter 50 when Spinoza critiques attempts at understanding through the imagination. As we shall see, comparison is only the lowest form of knowledge, completely unrelated to the knowledge of substance we acquire when we free the intellect from confusions caused by imagination. More importantly, it seems rather odd that something Spinoza declares “does not involve any negation” (E1def6) is actually negation *par excellence*.

¹⁵ The transitive relation between the infinite modes has given rise to questions about how finitude could ever arise in Spinoza’s system. For an interesting discussion of this problem and a summary of the related literature, see Frank Lucash “Finite and Infinite in Spinoza.” I offer my own solution below, see page 22 where I contend that finite modes are regions of infinite modes and incomprehensible on their own.

exactly, Spinoza means by ‘extension,’ because he does not define the term in the *Ethics*. A clear definition does appear in the *Principles of Cartesian Philosophy*, where Spinoza writes, “*Extension* is that which consists of three dimensions. But by extension we do not understand the act of extending, or anything other than quantity” (PCP2def1). While this seems straightforward enough, Meyer’s prefaces warns us that Spinoza deliberately eschews his own beliefs in favor of accurately articulating Descartes’. In a late letter, he rejects at least part of the definition when he responds to an objection raised by Tschirnhaus. Tschirnhaus contended that without the act of extending, the extended would be an inert mass, something merely passive. The essence of God cannot be passive, so unless extension is more than quantity, God cannot be extended. Extension must generate motion without the intervention of an external power, or else bodies will exceed extension. Spinoza recognizes the problem, and rejects the offending part of the definition. He declares, “from Extension as conceived by Descartes, to wit, an inert mass, it is not only difficult, as you say, but quite impossible to demonstrate the existence of bodies. For matter at rest, as far as in it lies, will continue to be at rest, and will not be set in motion except by a more powerful external cause” (Ep. 81: 956). Tschirnhaus asked Spinoza to demonstrate how bodies follow from extension, but Spinoza postponed doing so. He died before he could return to the problem.

While Spinoza never completely fulfilled Tschirnhaus’ request, we can sketch the solution by appealing to the so-called ‘physical digression’ and related letters. Spinoza’s extension differs markedly from the extended. In the Cartesian universe, an unextended God imparts motion to passive extension through miraculous creation. Like Descartes, Spinoza believes that bodies are only differentiated by motion-and-rest. A body distinguishes itself by moving at a different speed than the bodies surrounding it; more complex bodies assemble when simple bodies move together in ways that maintain a constant relation. Unlike Descartes, Spinoza denies that there is anything external to extension that can act on it. He opposes a dynamic extending to the static extended, and an infinite extension to indefinite extension.

The immediate and mediate infinite modes further separate Spinoza's extension from Descartes'. When Schuller, one of Leibniz's informants, requested an example of an immediate infinite mode and a mediate infinite mode, Spinoza responded by identifying motion-and-rest with the former and the face of the whole universe with the latter.¹⁶ In Schuller's brief commentary on the "Letter on the Infinite," he prefers to call Spinoza's extension 'immensity'.¹⁷ The immediate infinite mode makes extension dynamic. In this scheme, motion-and-rest occurs before any moving bodies appear, indicating an unconventional understanding of motion. In "Spinoza on Individuation," Lee Rice mistakenly aligns motion-and-rest with energy. He writes: "It seems natural to...translate the now unfamiliar phrase 'motion-and-rest' as 'energy.' Then Spinoza's physics rests on two principle claims: (1) that the extended world is a mechanical system whose total quantum of energy is a constant, and (2) that all changes among the bodies of the system can be adequately represented as transmissions of energy within the system." (1971b: 643). Spinoza's motion-and-rest is not identical with the modern notion of energy. Like the Cartesians, Spinoza measured activity by quantity of motion defined as the product of mass and velocity (mv). Spinoza died before Leibniz discovered that activity needs to be measured by *vis viva*, the product of mass and the square of the velocity (mv^2).¹⁸ Nevertheless, Rice's analysis is instructive. We can correct it by replacing 'quantum of energy' with 'quantity of activity.' On this interpretation, the changes in the distribution of activity within the system comprise the motions of bodies; the constant total quantity of activity, on the other hand, is the power through which extension

¹⁶ "The example you ask for of the first kind are: in the case of thought, absolutely infinite intellect; in the case of extension, motion and rest. An example of the second kind is the face of the whole universe, which, though varying in infinite ways, yet remains always the same" (Ep. 64: 919). See also the scholium to Lemma 7 of E2P14.

¹⁷ Schuller explains that Spinoza "defines God as follows: that which is an *absolutely* infinite being, i.e. a substance consisting of infinite attributes, each of which expresses eternal and infinite essence and is thus immense" (LoC 103).

¹⁸ Leibniz raised several objections to the Cartesian laws of motion long before he determined the correct measure of force. He reports that he explained some of these to Spinoza when the two met in The Hague and claims that he converted Spinoza to his point of view. However, he could not have shared his conception of *vis viva* because he discovered it a few years later. For Leibniz's argument for the conservation of *vis viva* rather than quantity of motion, see his *Discourse on Metaphysics*, especially §17.

expresses itself.¹⁹ Thus, we join several commentators in associating Spinoza's physics with what Bennett calls a 'field metaphysic'²⁰

The immediate infinite mode conceived as activity closely resembles the endeavour or conatus every individual has to maintain its own existence. This desire is the actual essence of the individual, its power and reality (E3P7). Since an individual consists in a certain constant relationship between changing parts, a successful endeavour involves retaining a total quantity of motion within that system. An individual's endeavour to maintain a harmonious relationship among its parts is an activity that produces the passive arrangement of its parts. The endeavour will succeed so long as the individual has more power or force than those things attempting to destroy it. When it is overpowered, it dies. As a drive to persistence, endeavour has temporal consequences: the duration of any given mode follows from its total endeavour compared to the various endeavours of other things in the universe. While Spinoza calls duration "the indefinite continuance of existing" (E2def5), this in no way implies that duration is contingent; instead, it indicates that no mode knows the precise extent of its own endeavour even though the effect of each endeavour is entirely determined by substance.²¹ The first infinite mode expresses itself by producing the entire spatial and temporal structure of the universe.

Natura naturans exists necessarily and immediately produces *Natura naturata*. First, extension deploys an infinite quantity of motion-and-rest that causes the extended and differentiates it into an infinity of finite modes in various relations one to another.²² Second, since the total quantity of motion-and-rest is constant,

¹⁹ I am grateful to Dr. Arthur for pointing Rice's error out to me.

²⁰ Rice gives a nice definition of this in his "Spinoza's Infinite Extension": "Extension is herein conceived as space itself, and bodies in space are viewed as perturbations or localizations of force therein" (1996c: 36). For an early example of this interpretation, see Errol Harris' "Finite and Infinite in Spinoza's System."

²¹ Spinoza writes, "the duration of our body depends on the common order of nature and the structure of the universe. Now there is in God adequate knowledge of the structure of the universe insofar as he has ideas of all the things in the universe" (E2P30Dem.).

²² Every body is differentiated from others by the specific amount of activity within it; this quantity follows immediately from extension and mediately from the whole order of nature. Hence every body is the product of two causal chains, as we shall see.

all the finite modes maintain a constant relation to one another. Spinoza contends that

since each one of [a composite individual's] parts is composed of several bodies, each single part can therefore, without any change in its nature, move with varying degrees of speed and consequently communicate its own motion to other parts with varying degrees of speed. Now if we go on and conceive a third kind of thing composed out of this second kind, we shall find it can be affected in many ways without change in its form. If we thus continue to infinity, we shall readily conceive the whole of Nature as one individual whose parts – that is, all the constituent bodies – vary in infinite ways without change in the individual as a whole (E2Lemma7S).

The whole universe, then, fits Spinoza's definition of an individual.²³ Unlike a finite individual, it cannot die, for its parts always remain in a harmonious relationship to one another. The face of the whole universe follows immediately from the first infinite mode, and mediately from extension. Activity expresses itself by deploying the entire interaction of every part of the universe in the order necessary for it to maintain that relationship. Time, conceived as this ordering, follows from the eternal force responsible for both the order and the ordered.

Spinoza's writings contain other hints of a four dimensional conception of extension, though of course he explains himself in different terms. He declares that substance and all its attributes are eternal (E1P20dem). For once, he clearly explains what he means when he uses the word: "By eternity I understand existence itself insofar as it is conceived as necessarily following from the definition of an eternal thing. Explication: For such existence is conceived as an eternal truth, just as is the essence of a thing, and therefore cannot be explicated through duration or time, even if duration be conceived as without beginning or end" (E1def8). Spinoza's definition of eternity directly parallels his conception of the absolutely infinite. The first infinite is the necessary and the self-sufficient. All infinite things of the first kind exist by definition – that is to say, they are

²³ Actually, Spinoza contradicts himself, for he claims, "By individual things I mean things that are *finite* and have determinate existence. If several individual things concur in one act in such a way as to be all together the cause of one effect, I consider them all, in that respect, as one individual" (E2def6, emphasis mine). By stretching the second half of this definition, Spinoza captures the mediate infinite mode, for the whole of the universe concurs in causing each finite mode.

eternal. Since something absolutely infinite must be eternal, the two words emphasize different aspects of the same thing. Just as thought and extension describe two different aspects of the one substance, so infinite and eternal describe the same four dimensional attribute, first according to the three spatial dimensions and second according to the fourth ‘temporal’ dimension.²⁴

While Spinoza also claims that the infinite modes are eternal, he seems to mean this in a different sense than the eternity of *Natura naturans*. He doesn’t even use the word when he describes the mediate infinite mode, although he does consider it a necessary existent, thus implying that it is eternal. The infinite modes are infinite by virtue of their cause, and therefore they do not exist by their own definition, but only through the definition of something else. In E1P24dem he points out that “only that whose nature (considered in itself) involves existence is self-caused and exists solely from the necessity of its own nature.” Eternal things, however, are just those things that *do* exist from the necessity of their own nature. So how is it that Spinoza can claim (a mere three propositions earlier) that *Natura naturata* is eternal? Notice that he also calls it infinite, without specifying the type of infinite that pertains to it.²⁵ I propose that we read eternity here in the same way that we read infinity: *Natura naturata* is eternal by the force of its cause, that is, by the force of the self-causing substance from which it necessarily proceeds (E1P33), while *Natura naturans* is eternal by the force of its very nature.

David Savan also draws this distinction, though he does not link it to the divisions of the infinite. In his “Spinoza on Duration, Time and Eternity,” he claims: “Eternity is infinite actual existence, *natura naturata*, connected as the necessary display of an infinite originative activity, *natura naturans*...Eternity is a way of conceiving the real unity of nature, dividing that unity conceptually into two – active cause and necessary effect” (2001g: 381). In other words, the eternal by its very nature generates the eternal by the force of its cause, and we must not

²⁴ I use the word ‘temporal’ in scare quotes because Spinoza argues that neither duration nor time describe *Natura naturans*; as we shall see, we define time with reference to eternity, but we cannot define eternity with reference to time.

²⁵ Spinoza makes similar inconsistent use of the term ‘free.’ In E2P17C2, he argues that only God is a free cause, and yet this does not prevent him from talking about the free man in E2P35S.

confuse the two. Despite his insight, Savan seems to miss the reason for the distinction. He argues that Spinoza's use of the word 'conception' to define eternity reveals an essential trait specific to the eternal: "conceiving is central to eternity in a way that it is not to the definitions of a free thing (1Def7) and infinity (1Def6ex, P8S1)" (2001g: 385). This is not entirely correct, for we will see that Spinoza explicitly invokes an infinity that has no relation to the imagination. Since Spinoza believes that "conception seems to express an activity of the mind" (2Def3ex), the highest infinity must belong to the third kind of knowledge, that which can only be conceived. Perhaps Savan wants to suggest that conceiving things through eternity and conceiving things through duration are both accurate representations of the universe.²⁶ If so, he is only describing the eternity of *Natura naturata*, for as we shall see *Natura naturans* has no relation whatsoever to duration or time.

i. Digression: the Infinite After its Kind

We should not confuse the distinction between the absolutely infinite and the infinite by virtue of its cause with the distinction between the absolutely infinite and the infinite after its kind. An attribute is absolutely infinite if it is conceived as *the* essence of substance, but not when it is conceived as *an* essence of substance. The essence of a thing is "that which, when granted, the thing is necessarily posited, and by the annulling of which the thing is necessarily annulled; or that without which the thing can neither be nor be conceived, and, vice versa, that which cannot be or be conceived without the thing" (E2def2). Clearly the essence of necessary being must exist necessarily. A thing cannot be called meaningfully the cause of its own essence, for the difference between a thing and its essence is only nominal. However, when we divide the essence of a thing, as we do when we talk about thought and extension as essences of substance, we are no longer dealing with the complete essence of the thing. This

²⁶ For an argument to this effect see Julie R. Klein "'By Eternity I Understand': Eternity According to Spinoza." Klein contends that eternity names the way something is known rather than a fact known about the thing: in particular, she maintains that eternity relates to intuitive knowing while sempiternity relates to rational knowing. She believes that both are accurate descriptions of reality. Given the wording of 1Def8 and the critique of imagination offered in the Letter to Meyer, it seems unlikely that Spinoza would agree.

is the reason Spinoza introduces a distinction between the absolutely infinite and the infinite after its kind. He writes, “If a thing is only infinite after its kind, one may deny it infinite attributes. But if a thing is absolutely infinite, whatever expresses essence and does not involve any negation belongs to its essence” (1def6). He contends that dividing substance into different independent essences can lead us to treat each essence as an independent substance. By calling an attribute ‘infinite after its kind,’ he reminds us that each attribute only expresses part of the absolutely infinite substance.

Spinoza explains this more explicitly in his letter to Henry Oldenburg on September 27, 1661. Responding to Oldenburg’s suggestion that thought could be physical and perhaps limit extension, Spinoza comments, “But I beg you to note, if someone says that Extension is not limited by Extension, but by Thought, will he not also be saying that Extension is infinite not in an absolute sense, but only insofar as it is Extension? That is, does he not grant me that Extension is infinite not in an absolute sense, but only insofar as it is Extension, that is, infinite after its kind?” (Ep. 4: 766). The infinite after its kind emphasizes the fact that attributes are not ontologically distinct. Attribute parallelism accomplishes a related objective, circumventing the Cartesian problem of mind-body interaction by denying the dualism at its foundation. Since extension and thought are both expressions of the essence God, the two are different descriptions of the same thing. Each change in the one parallels a change in the other, and no interaction is required.

Several commentators have taken the ontological unity of substance even further, attacking attributes as merely subjective products of human passivity.²⁷ We have seen above that for Spinoza the word ‘conception’ indicates an active state of the mind, and when the mind is active it is accurate, representing the universe as it really is. Spinoza uses the word ‘perception’ to express the opposite

²⁷ Significantly, Leibniz was the first to propose this interpretation. In his note on E1P4, he expresses surprise that attributes are not mentioned, reasoning that “it follows either that he speaks ambiguously or that he does not include the attributes among the things that exist outside the understanding, but merely substances and modes” (L 198). Spinoza goes on to claim this explicitly later on in book one, vindicating Leibniz’s suspicion. However, we have seen that

state of mind, passivity, that results when the mind is acted on and unable to form an adequate idea of the world. When Spinoza defines attribute, he writes “By attribute I mean that which the intellect *perceives* of substance as constituting its essence” (E1def4, emphasis mine). Spinoza believes that God is one, and that all of his attributes express the same thing in different ways. The unity of substance grounds attribute parallelism, but also threatens to undercut the status of attributes. Because we are always to some extent passive beings, we cannot get beyond our perception of God as having distinct attributes. And, indeed, this perception is close to the truth, especially when we remember that God has an infinite number of attributes. But Spinoza omits attributes when he declares, “nothing exists except substance and its modes” (E1P4). I will not enter into the interminable debate on the status of attributes here.²⁸ I mention it only to emphasize the contrast between attribute to mode and attribute to attribute comparisons. When we compare attributes to modes, whether infinite or finite, the attribute is absolutely infinite – it exists by definition – but when we compare attributes to attributes, an attribute is only infinite after its kind, for no single attribute adequately expresses the whole essence of God.²⁹

B. The Second Distinction

When modes unlimited by virtue of their cause are “conceived abstractly they can be divided into parts and regarded as finite” (LoC 113). We conceive abstractly when we rely on mental images to form our ideas of things. Despite our best efforts, our minds can only grasp a limited amount of information at any one time, and so our knowledge typically fails us in two ways. First, we always

Spinoza often expresses himself inaccurately, so this argument does not conclusively prove that attributes are subjective.

²⁸ Another piece of the puzzle appears at E2P40S1. There, Spinoza claims that our so-called ‘transcendental terms’ such as ‘entity’ or ‘thing’ are our most confused ideas, arising when we cannot recall the distinctions between the millions of simultaneous impressions we receive at any moment. Spinoza writes, “when the images in the body are utterly confused, the mind will also imagine all the bodies confusedly without any distinction, and will comprehend them, as it were, under one attribute.”

²⁹ We should not assume that the infinite after its kind applies only to attributes, or that things infinite after their kind exist necessarily. Leibniz, who shares Spinoza’s divisions of infinity, recognizes the infinite after its kind as the lowest form of infinity. He points out that an infinitely long line can be infinite after its kind; for example, any line unbounded on both sides is infinite after its kind, while a line unbounded on only one side is not.

force finite modes into general categories, neglecting the specific characteristics that separate an individual from all others of the same class. We forget that each and every concrete individual thing results from a unique causal sequence, a sequence sufficient to differentiate even nearly indistinguishable modes. But attempts to redress the first failing lead us to the second: the more we stress the differences between modes, the more we risk attributing a substantial identity to the modes. No mode causes itself; each one depends on substance and all but the immediate infinite modes require other modes. Therefore, each finite mode is only a part of an individual, not an individual in its own right.³⁰ Just as we believe that we have free will because we are ignorant of the causes of our actions, so too every identification of a finite mode distorts an aspect essential to the mode it names. Finitude, then, derives only from abstraction or imagination; it is not a coherent notion.

We must be careful not to ascribe to Spinoza a view he does not hold. Clearly, Spinoza does not deny the existence of finite modes; however, he does deny them a certain *kind* of existence. His concern with the finite is epistemic: in order to combat the passive emotions, Spinoza attacks our reliance on common sense. We tend to think of modes as wholes, or self-sufficient units, when they are only ways, or sections of something else. Antony Dugdale distinguishes these two ways of conceptualizing modes by conceiving parts in two different ways: we perceive modes through imagination when we treat them as pieces or detachable parts; we conceive modes through the intellect when we treat them as regions or non-detachable parts: “Substance monism requires that substance not be ‘composed of’ parts, that is, not actually be divisible into pieces. But substance does ‘have’ parts, that is, distinguishable but mutually interdependent regions” (2001c: 288). The pieces – regions distinction captures the difference between real and modal distinction (see E1P15). Dugdale reminds us that Spinoza’s arguments are everywhere directed against the detachable part.

³⁰ In other words, every finite individual is only an individual after a manner of speaking, but as Rice explains, this does not mean that the relation that makes a mode an individual is unreal: “Every individual is part of an individual of still higher complexity; but it does not thereby

In the *Short Treatise*, Spinoza defines detachable parts as distinct conceptual units: “A thing composed of different parts must be such that the parts thereof, taken separately, can be conceived and understood without another...Each [part] can be conceived and understood without the composite whole being necessary” (ST I.ii 44 see also EP 35). Parts like these are beings of reason, or aids to the imagination, as are the wholes composed of them. Since every mode is in and conceived through something else (E1def5), detachable parts have a substantial unity not possible for mere modes of substance. Parts in the *Ethics* are understood quite differently: “We are a part of Nature, which cannot be conceived through itself, without the others” (E4P2 cf. E1P13). In other words, we are regions within infinite substance. The human being cannot exist without community and history any more than it can exist without food and oxygen. We are produced by our environment in such a way that we cannot conceive ourselves adequately without appealing to modes beyond us.

In his letter to Henry Oldenburg of November 20, 1665, Spinoza explains the relationship between parts and wholes: “I consider things as parts of a whole to the extent that their natures adapt themselves to one another so that they are in the closest possible agreement. Insofar as they are different from one another, to that extent each one forms in our mind a separate idea and is therefore considered as a whole, not a part” (Ep. 32: 848). In other words, the decision to call a thing a whole is always somewhat arbitrary. Our sensory apparatus predisposes us to recognize some modes as individuals, based on completely relative features like speed and scale. Further, we often define parts and wholes based on the purposes at hand, classifying wholes according to the practical concerns of everyday life. Neither of these prejudices proves the metaphysical unity of the things we treat as independent entities.

Spinoza illustrates the different concepts of whole by describing a worm swimming in blood. At one scale, we imagine blood as a whole, though we know that blood contains a number of different types of particles – white blood cells,

sacrifice its own status as an individual, since its very inclusion in the larger whole presupposes the continuation of those very internal relations which determine its individuation” (1971: 650).

red blood cells, lymph, etc. – which we conceive as parts of the blood. These particles interact with one another in such a way that blood behaves as a united whole. Yet we can also see blood as a part of a larger body (if we are examining the circulatory system, for example), if we isolate a different level of description.³¹ On the other hand, a creature small enough to live in the blood would see each particle as a whole independent of the blood, while the ‘whole’ fluid would escape its attention. Our experiences of the universe resemble the worm’s experience of the blood – all the ‘wholes’ we picture around us are only parts of the whole universe, interacting according to definite laws and thereby maintaining a constant relationship with one another, despite the perpetual generation and destruction of new parts. We are modes within the infinite mediate mode, a wrinkle on the face of the whole universe.³²

The finite modes belong to the infinity that “cannot be expounded by or equated with any number.”³³ Whereas the first distinction separates substance from its immediate and mediate infinite modes, the second separates both substance and the infinite modes from the infinity of finite modes within them. First, Spinoza identifies two ways a thing can be metaphysically unlimited; next, he turns his attention to the difference between this metaphysical infinite and the mathematical infinite that applies to finite modes. Spinoza intends his distinctions to penetrate the confusion he locates at the heart of the paradoxes of the infinite.

~~We have seen that our apprehension of the finite involves abstractions.~~

We imagine a comparison between things based on certain similarities in the way

³¹ William Sacksteder shares my emphasis on the relativity of the terms ‘part’ and ‘whole’ in his essay “Spinoza on Part and Whole: The Worm’s Eye View.” He writes, “In these definitions, Spinoza is not pointing to things which are wholes or parts simply. Rather, they are one or the other *in some respect*, according to the manner in which we take this or that object of reference” (1978d: 143).

³² Spinoza writes, “every body, insofar as it exists as modified in some definite way, must be considered as a part of the whole universe, and as agreeing with the whole and cohering with other parts” (Ep. 32: 849). We need to learn to see the universe as an organic whole rather than as a conglomerate of distinct parts. The blood parasite does not know that its world is one fluid in a larger universe; we cannot be certain that our universe is not of the same order. We can imagine ourselves living in the blood of some greater animal just as easily as we can imagine the bacteria living in the worm. Spinoza’s account parallels Leibniz’s belief that there are worlds within worlds *ad infinitum*. See Levey’s description of the metaphor ‘fleas on fleas’ in his “The interval of Motion in Leibniz’s *Pacidius Philalethi*” (2003b: 42, n. 34).

they affect our bodies. We abstract from this a measure, but we often fail to recall that this means of comparison is strictly human and does not pertain to the actual world. In fact, our passivity almost guarantees our forgetfulness: the egg I had for breakfast yesterday so closely resembles the one I eat today that I call each egg an instance of the same thing. Not only do I treat each egg as a detachable part, but I ignore the slightly different size and shape of the two eggs, and admit only a numerical difference between them. Thus, passivity is the source of number.

Spinoza defends his account in Letter 50. Numbers, he argues, apply only when we identify a set of things: “we do not conceive things under the category of numbers unless they are included in a common class” (Ep. 50: 892). If we found ourselves holding a dollar and a penny, we would never describe the objects as ‘two’ unless we already had the concept ‘coins’ or ‘money.’ In other words, when we count things, we assert a similarity between them that disregards the individual essences of modes. Numbers, then, are aids to the imagination. When we treat them as such, we can use them to our advantage; but when treat them like real things, we invent a false infinity riddled with paradoxes.

Bennett rejects outright Spinoza’s conception of numbers, arguing that Spinoza himself ignores it when he speaks of one, unique substance. He dismisses attempts to reconcile the use of ‘one’ in a non-numerical sense. For example, Martial Gueroult writes, “Bref, ce qui exclut toute multiplicité est, au sens métaphysique, un Un, un Unique, au-dessus de tout nombre, y compris du nombre un” (1968: 157). Gueroult claims that we can understand the word ‘one’ as a proper name, that is neither a property nor a predicate, and cannot be multiplied, even though it could behave like a plural. Gueroult does not explain what he means by these comments,³⁴ and Bennett has no use for them. He writes, “If we think that the treatment of number in Letter 50 was wrong, we are spared these desperate shifts and are free to suppose that Spinoza came to see the error of his ways sufficiently to put number concepts on a longer leash” (1984: 198). If

³³ Leibniz explains that the difference between these two is the difference between rational and irrational numbers.

this were the case, one would expect to see Spinoza making use of number in this new fashion. Yet even at the end of his life, he still treats number as an imaginary concept useless for metaphysical truth.³⁵

Frege praises Spinoza's insight in his *Foundations of Arithmetic*, echoing Spinoza with the statement "numbers are assigned only to concepts" (1956: 61e). Bennett rejoins that there is no reason why this must be a single concept like 'coins,' and suggests "those three items – those three numberabilia" instead (1984: 197). But this response hardly undermines Spinoza's point. We abstract from the individual essence of a mode to invent a class like 'chicken eggs.' This enables us to assign abstract individuals to that class, giving rise to numbers. Classes can be more or less general. Someone who has only encountered chicken eggs will need to introduce the more abstract class 'eggs' if she wants to add an alligator egg to her three chicken eggs. At the limit of this abstraction comes Bennett's 'numberabilia': when we want to include a hydrogen atom and an elephant in a single class, we invent a class devoid of any content other than quantity. Spinoza rejects all such abstractions as the height of confusion – especially when we do not acknowledge them as abstractions.

How can Spinoza claim that the sentence 'there is only one substance' is false? There is a third option between metaphorical nonsense and numerical realism, and it is one Bennett himself opts for earlier in his study. We could understand Spinoza's use of the term 'one' simply to differentiate his system from those appealing to multiple substances. Bennett imagines someone asking Spinoza the question 'how many substances are there?' He suggests that we can see him "not giving the answer 'One' but rather as rejecting the question. That is, perhaps his metaphysics takes 'substance' not to be a count noun like 'pebble' but rather a mass noun like 'water'" and the fact that it appears as if he is using 'substance' as a count noun is instead an attempt at being as clear as possible: "Someone who thinks there is only *substance*, confronted with other people who

³⁴ Though Gueroult does not go into detail in his commentary, he links this comment to Frege in a brief footnote. Compare José Benardette's argument that one is not a number in *Infinity*, pages 41-43.

think there are substances, might say ‘There is only one substance’ meaning only that the plural is inappropriate” (1984: 104).³⁶ Bennett’s own suggestion undermines his later attempt to attribute a different concept of number to Spinoza, and we should accept that he maintained the same concept throughout his writings, no matter how inadequate that concept might be.³⁷

Spinoza believes numbers are useful but dangerous tools. While they can serve our purposes in so far as we attach them to finite collections, any use of infinite numbers immediately launches us into the depths of confusion. Spinoza contends that paradox results whenever we break the infinite into parts. In the *Ethics*, he defends this position with the familiar argument that a line divided into an infinity of inches would have twelve times the number of parts as the same line divided into an infinity of feet. In other words, two infinite numbers, one twelve times that of the other, would result (E1P15S). This argument closely resembles Galileo’s paradox, but Spinoza escapes Galileo’s conclusion by refusing to consider either collection something with a definite number of parts. He believes that number simply does not apply to the infinite.

In the letter to Meyer, he uses a seminal example from Descartes’ *Principles of Philosophy* to interrogate infinity. Descartes describes a fluid flowing between a space bounded by two non-concentric circles. As the fluid rushes into the ever narrowing canal, the particles that constitute it are torn into an indefinite multitude of particles that attain indefinite degrees of speed. No matter how small a portion of the fluid one isolates, one will still find particles moving at different speeds. Thus, every part of the fluid violates the definition of a simple individual, and so no matter how small a portion of the fluid one isolates, one will find it actually divided into even smaller portions. Descartes explains the motion of the particles around the non-concentric circles as “a division of certain parts of

³⁵ See Ep. 81. We will return to this letter in chapter two, when we examine the objection that gave rise to it.

³⁶ Savan offers a similar interpretation: “What is numbered must be distinguished from the class to which it is assigned. Since the existence and essence of generative nature are identical, it cannot be a member of any class and cannot be said to be one or single” (2001g: 380).

³⁷ To Bennett’s credit, Spinoza does not follow his own advice. In E5P8, for example, he writes as if number applied to reality: “The greater the number of causes that simultaneously occur in arousing an emotion, the greater the emotion.”

matter to infinity, or an indefinite division into so many particles that we cannot conceive of any so small that we do not understand that is *in fact divided* into others even smaller” (PP 2 §34 italics mine). The motion of the fluid produces far more divisions between the particles than any human mind can possibly comprehend. The divisions between particles are divisions in fact, not divisions introduced by the mind in its attempts to understand the world.

Spinoza uses Descartes’ example to attack infinite number. He argues that if the motion of the fluid produces an infinite number of particles, we would have to admit that there are as many particles in half the space as in the whole space. Because Spinoza never questions the axiom that the whole is greater than the part, he immediately infers that infinite number is absurd. He believes that rather than the human mind failing to find the correct number of divisions, numbers cannot apply to certain situations. Without an infinite number, there is no last division of the particles. Spinoza concludes that there is no number of particles anywhere in the space, although he insists that there are twice as many parts in the whole as there are in the half.³⁸

Spinoza insists that we understand the infinite division of particles syncategorematically. Analogous to but not identical with Aristotle’s potential infinite, the syncategorematic infinite always exceeds any given finite measure, without ever arriving at a last term or a finished whole. By contrast, the categorematic infinite specifies just this final ‘infinitieth’ term. A. W. Moore points out the subtle difference between the two concepts: “Roughly: to use ‘infinite’ categorematically is to say that there is something which has a property that surpasses any finite measure; to use it syncategorematically is to say that, given any finite measure, there is something which has a property that surpasses it” (2001e: 51). The categorematic interpretation considers infinite number to be the maximum unit of measure. It construes infinite number as a single,

³⁸ In “Spinoza’s Letter on the Infinite,” Gueroult suggests that the infinite that exceeds any measure refers only to bounded collections, but this is obviously not the case. In Shirley’s translation the latter half of the second distinction reads, “although we *may* know its maximum and minimum.” This implies that we do not need to know the maximum and minimum in order to classify something as exceeding all number. The geometrical example shows that even bounded collections escape enumeration; unbounded collections do so to an even greater degree.

unincreasable whole. Spinoza contends that this conception of infinite number only perpetuates paradox. The syncategorematic interpretation he defends treats infinite numbers as nothing more than fictions. To say ‘an infinite number’ is to say that it increases beyond any measure.

Despite similarities, the syncategorematic infinite cannot be identified with the potential infinite. While the syncategorematic infinite is a positive conception of infinity, the potential infinite springs from a fundamental distrust of infinity. For Aristotle, the potential infinite expresses that fact that there are no limits to the divisions we can make *by reason* in the thing; not only is there no last division corresponding to the word ‘infinite,’ but there is no time at which a body is actually infinitely divided. The infinite by division “is not separable from the process of bisection, and its infinity is not a permanent actuality but consists in the process of coming to be, like time and the number of time” (III 7 207^b 14). The potential infinite is a negative concept, something referring to the mind’s capacity to multiply divisions without limit. The infinite’s “essence is privation” (III 7 207^b 35). The syncategorematic infinite by division, on the contrary, states that the thing is actually infinitely *divided*, without that division entailing a last or infinitieth division.

Spinoza rejects the negative infinite Descartes calls ‘the indefinite.’

Descartes maintains that we have intuitive knowledge of the complete absence of limits in the absolutely infinite God, while we simply lack knowledge of the limits of the quantitative indefinite infinite. We can call the indefinite the ‘agnostic infinite’; it is an infinity about which we can only say that we do not know its limits. Descartes advises his readers to

reserve the term ‘infinite’ for God alone; because in Him alone, in every respect, we not only recognize no limits {to His perfection}, but also in a positive sense understand that there are none; and also because we do not similarly understand in a positive sense that other things are in some respect without limits, but only in a negative sense acknowledge that we cannot find their limits if they have any. {And thus we know that these things are not absolutely perfect, because we understand that this apparent lack of limits results from the weakness of our own understanding rather than from the nature of these things}. (PP 1 §27)

Descartes' position is untenable as it stands,³⁹ and reads like a concession to orthodoxy. Even by the latter's standards, Spinoza's distinction between the absolute infinite and the infinite by the force of its cause does away with the need for the indefinite entirely. So long as one recognizes the dependence of lesser infinities on the absolutely infinite substance, one can apply infinity to other things without detracting from God's perfection or appealing to human frailty.

At first sight it would seem that Spinoza upholds Descartes' indefinite, for when he reports the example in Letter 12, he writes, these "others, finally, are called infinite, or if you prefer, indefinite" (LoC 113). But even Descartes has trouble claiming that this is merely an indefinite division. He authoritatively proclaims that the division is infinite, and then he qualifies the judgment with his technical term 'indefinite'. Why didn't he remove this comment from the fair copy? Spinoza's division of the infinite allows him to correct Descartes' statement: we are aware of the positive lack of limits obtaining in this example, and this manifests itself in our recognition of the inability to number the particles. We know that every division that can be made is made, but correctly understanding the division requires us to reject aids to the imagination.

The syncategorematic interpretation of infinity does not consider infinite number a real unit. Instead, indicating an infinite number of divisions can only mean 'more than any assignable number of divisions.' Moore offers a technical description of the infinite by division: the syncategorematic position claims (i) "For every natural number n , there is a possible situation s , such that this body is divided into more than n parts in s ." The categorematic position, on the other hand, holds (ii) "There is a possible situation s , such that for every natural number n , this body is divided into more than n parts in s " (2001e: 42). Statement (i) means that for any number of divisions we assign to the situation, that number is too low. Statement (ii) means that there is highest number of divisions, namely an infinite number of them. According to Spinoza, however, numbers always refer to determinate sets. Reference to more than any assignable number is thus not a

³⁹ Leibniz lambastes Descartes for asserting that the weakness of our understanding proves the imperfection of other things: "Descartes' 'indefinite' is not in the thing but in the thinker" (LoC: 339).

reference to a number at all. Spinoza refuses to abbreviate the syncategorematic infinite with the phrase ‘infinite number,’ reserving it exclusively for the categorematic infinite.⁴⁰

Spinoza rejects the categorematic interpretation of infinity. In the *Principles of Cartesian Philosophy*, he presents a paradox he ascribes to Zeno of Elea.⁴¹ Zeno argued that if we picture a wheel moving infinitely quickly, a point D on the wheel would occupy the same place at every moment, and so infinite speed is indistinguishable from rest. Spinoza identifies two assumptions necessary for Zeno’s argument: (1) a body can move so quickly that it cannot be conceived to move more quickly; and (2) there is such a thing as an indivisible temporal moment. In other words, Zeno’s paradox is only possible on the basis of a categorematic interpretation of infinity. Spinoza rejects both of Zeno’s assumptions. There is no motion so fast that there cannot be a faster motion; there is no moment so small that there cannot be a shorter moment. He offers his response as a thought experiment: imagine if Zeno’s wheel drives, by means of a belt, another wheel half its size also containing a point D. The second wheel moves twice as fast as the first, “and consequently the point D is at every half-moment again in the same place” (PCP2P6S). Now imagine the second drives a third and the third, a fourth and so on *ad infinitum*. We can continue adding faster wheels to our machine without ever introducing a contradiction, so “it is contrary to our intellect to conceive a motion so fast...that there can be no faster motion” (PCP2P6S).⁴² Spinoza takes his refutation to be definitive, and he uses it to

⁴⁰ Spinoza is clearly more dogmatic than Leibniz when it comes to the use of aids to the imagination. Leibniz allows one to say ‘an infinite number’ as shorthand for the ponderous syncategorematic definition. Introducing a similar abbreviation into mathematics leads him to the calculus. Spinoza, on the other hand, insists that the word ‘number’ only signifies something finite. The severe constraints he places on language only more perfectly illustrate his commitment to the syncategorematic infinite. Of course, this does not prevent him from using the phrase ‘infinite number’ numerous times in the *Ethics*; see E2P45S and 2P8S, among other examples.

⁴¹ This is not one of the paradoxes we attribute to Zeno, though it resembles them. Its origins are unknown.

⁴² More explains the difference between the categorematic and the syncategorematic interpretations of the sentence ‘This body can move infinitely fast.’ (i) Categorematically, the sentence means “This body is capable of attaining an infinite speed”; (ii) syncategorematically, it means “There is no limit to the finite speeds which this body is capable of attaining” (2001e: 51). Zeno believes his wheel moves as defined in (i), while Spinoza argues that by (ii), we can always attach another wheel.

bolster his argument against infinite numbers or indivisible moments, as we shall see.

i. Digression: the Hypercategorematic Infinite

It is possible that Spinoza intends every accurate use of the word ‘infinity’ syncategorematically, no matter which level of infinite he refers to. However, the univocal interpretation of infinity in Spinoza threatens to obliterate the difference in kind between the absolutely infinite and all of its derivatives. Leibniz, who endorses a similar division of infinity, identifies God with something he calls the ‘hypercategorematic’ infinite. Certainly when he read the Letter to Meyer, he thought that Spinoza was endorsing a hierarchy of the infinite similar to his own. Leibniz believes that “the third degree of infinity, and this is the highest degree, is *everything*, and this kind of infinite is in God” (LoC 43). Leibniz explains his conception of God in his *New Essays on Human Understanding*, where he writes, “The true infinite, strictly speaking, is only in the *absolute*, which precedes all composition and is not formed by the addition of parts” (NEHU 157). Leibniz’s doctrine coincides with Cantor’s, despite the dramatic differences between their interpretations of infinity. In *Cantorian Set Theory and Limitation of Size*, Michael Hallett explains the difference between the transfinite and the absolute. He stresses the fact that unlike categorematic infinities, the absolute cannot be increased. Cantor writes, “we must make a *fundamental* distinction here between: (IIa) Increasable actual-infinite or *transfinite* (IIb) Unincreasable actual-infinite or *Absolute*” (quoted in 1986: 41). Since the difference between categorematic and syncategorematic infinities rests on the difference between ways each can be increased, the same distinction can help us understand the difference between the hypercategorematic and the syncategorematic. The former is the indivisible unity at the heart of all the syncategorematic variety in the universe.

Leibniz’s explanation accords with Bennett’s interpretation of infinity as totality, and Spinoza himself asserts that God is everything, an indivisible unity without parts. However, we must be careful to distinguish Leibniz’s world from Spinoza’s. For Leibniz, the hypercategorematic infinite crowns a hierarchy of existing things. It applies only to God, the supreme reality in Leibniz’s

philosophy. God is a person – a being who makes conscious decisions out of concern for the well-being of his creations. We measure the human and the divine on different though analogous scales: he is eminently good, something human goodness only imitates in a lesser sense. The hypercategoric infinite is a theological notion; its purpose is to separate creatures from God and defend a relatively orthodox tradition of eminence and analogy. To further separate God from mundane things like dirt and blood parasites, Leibniz introduces multiple levels of reality each emanating from the divine being. The hypercategoric infinite spills over into the hierarchies of created things. First, God produces angels and humans – intelligent, self-conscious monads infinitely more important (and real) than every other monad. Beneath these, God creates all the other monads. But each monad stands in hierarchical relationship to every other. Superior animals stand higher on the ladder than lesser ones, animate monads above inanimate monads, and all of these above ‘bare’ monads at the bottom of the ladder.⁴³ Lower still we find bodies, which derive their reality from the monads which have them. The sum of the relations between these bodies produce real space and time, and real space and time ground ideal entities like space and time considered in the abstract.

While we have seen a somewhat similar hierarchy in Spinoza, the two are not identical. Spinoza agrees that our abstract measures are less real than more direct modifications of the substance. For Spinoza, however, God is not something beyond the world, and certainly not a personal creator. He rejects any conception that treats the being of modes equivocally. Power alone distinguishes one mode from another; to the extent that a mode is more powerful than others, it will be able to persist longer than others. He wants to replace an equivocal notion of being with a univocal one, where everything in the universe exists in the same way: “For we are wont to classify all the individuals in Nature under one genus which is called the highest genus, namely the notion of Entity [Being], which pertains to all the individuals in Nature without exception” (Book IV Preface

⁴³ Since this hierarchy is syncategoric, the bare monad is only metaphorically at the bottom of the ladder; it is also broken up into an infinity of other monads or worlds within worlds to infinity.

321).⁴⁴ Spinoza's attribute parallelism does away with any hierarchy between mind and body; the two are one and the same thing considered in different ways. The attack on final causes does the same to a hierarchy that places humans above everything else in nature. We only reveal our ignorance when we think that nature cares more for our lives than for the lives of the bacteria that destroy us.

Spinoza gives an eloquent definition of univocal being: Nature is identical with God. When we consider everything that is, in every detail, we will have considered God, for we will realize the absolute necessity of everything that exists. But we should not start treating God like a person: just as the universe is indifferent to human pleasure and suffering, so too substance is nothing like a human being. Spinoza's God differs markedly from Leibniz's God. Throughout the *Ethics*, Spinoza attacks anthropomorphic treatments of substance. His philosophy demythologizes our concept of God, destroying the inherited, primitive idea of God as a great man in the sky. In its place, Spinoza affirms a completely determined scientific natural order. Clearly, Leibniz's God is not 'everything' in the same way that substance is for Spinoza. The monads depend on God for their existence, but they are not modes of God but distinct entities separate from him.

To avoid anthropomorphic interpretations of substance, I suggest a revised translation of E1def6. Instead of reading "By God I mean *an* absolutely infinite being" I suggest we say "By God I mean absolutely infinite *being*."⁴⁵ Eternity is existence itself, and so substance is not a being among others, but being itself: it is power, reality, and necessity. The existence of substance is of an entirely different kind than the existence of modes, namely, substance is existence itself. The difference between Spinoza's version of the ontological argument and the versions propounded by almost every one else illustrates the point. Whereas most philosophers try to prove the existence of God by appealing to perfection, and

⁴⁴ For an elaborate interpretation of Spinoza's univocal definition of being and his attack on eminence and analogy, see Gilles Deleuze, *Expressionism in Philosophy*. David Savan also believes that Spinoza defends a univocal view. See his "Spinoza on Duration, Time and Eternity."

⁴⁵ The Latin reads, "Per Deum intelligo ens absolute infinitum, hoc est, substantiam constantem infinitis attributis, quorum unumquodque aeternam et infinitam essentiam exprimit." I owe this suggestion to a conversation with Paul Sweeney.

indeed God's eminent perfection,⁴⁶ Spinoza appeals to necessity alone. Perfection in Spinoza only means reality or power. Every mode manifests substance – being or power – in the same way; for as Spinoza declares at E1P25S, “In a word, in the same sense that God is said to be self-caused he must also be said to be the cause of all things.”

At first, this univocal conception of being may seem contrary to the distinctions between types of infinity. Spinoza seems to be equivocating on ‘infinite’ throughout his works, assigning an eminent meaning to God's infinity different than the infinity of anything else. But the different senses of infinity are not founded on any mystical image of God. Spinoza does not say that God is infinite in a way similar to the infinity of modes, and that we must interpret this infinity metaphorically. Instead, he founds the division on logic, where ‘necessity’ has different meanings depending on whether one is speaking about causes or effects. In the first case, necessity means something that causes itself or exists by definition; in the second, necessity means an effect, something that cannot fail to result from a cause but cannot bring itself about in the absence of that cause. The divisions of infinity are not founded on eminence, analogy, or equivocation.

Spinoza illustrates the univocal conception of infinity nicely in the only axiom in book four: the power axiom. Spinoza proclaims that there is no such thing as the most powerful natural being: “There is in Nature no individual thing that is not surpassed in strength and power by some other thing. Whatsoever thing there is, there is another more powerful by which the said thing can be destroyed.” If God is conceived as something with power, then this axiom would imply an eminent interpretation of God. On my reading, however, God simply is power. The axiom nicely reveals the syncategorematic definition of infinity: just as no being in nature is the most powerful, power itself has no limits. No matter how much power one imagines, there is always more.

Spinoza's assertion that God has infinite attributes lends further support to my interpretation. No matter how many attributes one assigns to substance, it will

⁴⁶ Compare Anselm's response to Gaulino's perfect island.

always have more. Since an attribute is an essence of God, this implies that there is no complete essence of God. Bennett interprets ‘infinite attributes’ as ‘all attributes,’ but this does not necessarily mean that there is such a thing as the collection of all the attributes. Spinoza maintains that there is no number of attributes of God – he is all the attributes, true, but this ‘all’ refers to the fact that no matter what we perceive or conceive, it is in God. Ockham distinguishes between ‘syncategorematic’ and ‘categorematic’ by comparing the way words of each type refer to objects. He argues that syncategorematic terms do not refer to an entity and do not have a fixed meaning; instead the meaning of syncategorematic terms derives from the way they modify categorematic terms. For example, the word ‘humankind’ is categorematic, because it refers to every human. The word ‘all,’ on the other hand, does not specify some individual thing;⁴⁷ instead, it changes the meaning of another term. When one says ‘Humans err’ one does not mean the same thing as when one says ‘All human errs.’ The first statement indicates a general condition: many human beings make mistakes. The addition of the syncategorematic term ‘all’ in the second statement increases its scope to categorematic proportions. In Spinoza’s philosophy, ‘God’ signifies every occurrence whatsoever, but only when we consider things in the right way (namely *sub specie aeternitas*). To say that God is nothing over and above nature is to say that the word ‘God’ does not refer to an entity – it is like saying ‘all.’

We can alleviate the tension between the definition of God as a unity (which is to say something with nothing outside of it) and the claim that his God must be understood syncategorematically (which is to say that there is always something outside of it) by appealing to the two typical readings of Spinoza. If by ‘God’ we mean a categorematic or hypercategorematic entity outside the world, then Spinoza is an atheist. If by ‘God’ we mean immanent syncategorematic universe, then Spinoza is a pantheist. The pantheist reading has two aspects: first, everything in the universe is part of God; second, we will never be able to find a

⁴⁷ The word ‘all’ does not come up in Ockham’s classification; however, it is frequently used to explicate the categorematic words. Ockham writes that the categorematic term ‘man’ means ‘all men.’ In the absence of the word ‘man’ or some other categorematic term, the word

final part of the universe. Our perceptions of this God can only be an inadequate image of the necessary force within the universe, perpetually expressing itself in infinite ways. Both the atheist and pantheist interpretations of Spinoza serve as correctives to the desire to collapse his substance back into the orthodox tradition he so adamantly opposed. While there are flaws in this interpretation, it seems to me to be the most consistent with Spinoza's larger philosophy. While he may not have expressed it clearly throughout the *Ethics*, many of his fundamental doctrines are clouded in the same obscurity.

C. The Third Distinction

Finally, we turn to the third distinction. I have repeatedly stressed the difference between ideas coming from the imagination and ideas coming from the intellect. While I do not want to belabor the point, I should add a few brief comments on Spinoza's epistemology. Spinoza held to three kinds of knowledge: the inadequate knowledge of images, the adequate knowledge of common notions and the intuitive knowledge of essences. Inadequate knowledge comes from sensory contact with external bodies: our minds form images based on the body's collisions with other bodies. When we frequently encounter two bodies together, we come to expect the one on the basis of the other; often, we immediately infer the second body after we chance upon the first, even when that second body does not appear.⁴⁸

While there are always potential dangers associated with the imagination, it does not always lead to erroneous conclusions. So long as we exercise caution when relying on the imagination, using rational concepts to regulate our conclusions, the imagination is a powerful tool. Spinoza writes:

We will assign the word 'images' to those affections of the human body the ideas of which set forth external bodies as if they were present to us...And when the mind regards bodies in this way, we shall say that it 'imagines' them...the mind does not err in the fact that it imagines, but only insofar as it is considered to lack the ideas which excludes the existence of those things which it imagines to be present to itself. For if the mind, in imagining nonexistent things to be present to it, knew at the

'all' does not refer to anything: it is a syncategorematic term. See his *Philosophical Writings* pp. 51-2.

⁴⁸ Compare Hume's similar account.

same time that those things did not exist in fact, it would surely impute this power of imagining not to a defect but to the strength of its own nature, especially if this faculty of imagining were to depend solely on its own nature; that is, (Def. 7, I), if this faculty of imagining were free. (E2P17Sch.)

The power to imagine things is extremely useful so long as one imagines consciously. Unfortunately, human beings rarely rise above passive interactions with bodies to active knowledge; we almost always assume that the things we imagine actually exist exactly as we perceive them. Since we cannot avoid perception, we must carefully guard against drawing false conclusion from our experiences. Lewis Schipper points out that “empirical knowledge and experience provide a necessary starting point for knowledge. We can derive true knowledge by applying correctives to our confused perceptions” (1993: 32). The correctives come from the second type of knowledge.

Spinoza identifies the second kind of knowledge with what he calls common notions: “From the fact that we have common notions and adequate ideas of the properties of things I shall refer to this as ‘reason’ and ‘knowledge of the second kind’” (E2P40S2). The body experiences two types of collision: those that strengthen us and those that weaken us. When external bodies collide with ours in a way that harmonizes with our constitutive relation, they make us stronger, and cause us to experience joy. The joyful emotion leads us to examine these complementary bodies and find common elements between them and us. As Deleuze points out “The common notions are so named not because they are common to all minds, but primarily because they represent something common to bodies, either all bodies (extension, motion and rest) or to some bodies (at least two, mine and another)” (1988a: 54). In E2P38C, Spinoza argues that adequate knowledge is common to all minds only on the basis of being common to all bodies; since thought and extension parallel one another, whenever two bodies agree, the mind of each contains the idea common to both. However, we do not immediately recognize these ideas, and must carefully compare our experiences if we wish to formulate them. The imagination does not always produce errors, but it remains confused until we begin to actively extract common notions from it.

Knowledge requires the senses, so adequate knowledge makes frequent use of the imagination.

On the other hand, we have seen that we cannot accurately conceive certain ideas without completely rejecting the influence of imagination. Aids to the imagination always damage our knowledge of the absolutely infinite God, because they always involve some degree of passivity. We achieve completely active knowledge only through the third kind of knowledge, “the knowledge of essences.” Through it, we become aware of our innate knowledge of the absolutely infinite: the one thing common to all bodies and all knowledge is the underlying substance that upholds all the bodies with which we interact.⁴⁹ When we begin to focus on this essence, we are capable of discovering the essence of all other things. Adequate knowledge freed from imaginary concepts gives us access to the true infinite, and the ability to derive all finite things from this infinite.

For Spinoza, the absolutely infinite is the basic concept. We dismiss knowledge dependent on imagination, and free ourselves of an illusory infinite derived from the finite. Indeed, the finite conceived as a detachable part reveals itself as an incoherent notion. Rice explains, “The whole thrust of the first part of the *Ethics* is that one must *begin* philosophical reflexion with an adequate concept of the infinite (substance), and that the concept of (finitary) modes is derivative from this concept, rather than vice versa” (1996c: 39). Spinoza’s explanation of the knowledge of essences is cryptic and difficult; we will not go into the details. However, we should not dismiss it, as commentators often do, as mere mystical nonsense. Spinoza’s monism demands a strictly scientific investigation of nature. Since God and nature are synonymous terms, we should read the *Ethics* as a demystification of God rather than an invitation to obscurity.⁵⁰ His call to arms is “nobody has yet determined the limits of the body’s capabilities: that is, nobody as yet knows from experience what a body can and cannot do” (E3P2S).⁵¹

⁴⁹ “Every idea of any body or particular thing existing in actuality necessarily involves the eternal and infinite essence of God” (E2P45).

⁵⁰ On this point, see Stuart Hampshire’s *Spinoza*, p. 37.

⁵¹ Deleuze examines this manifesto in his *Spinoza: Practical Philosophy*.

2. Time

The rejection of number leads directly to the rejection of time. As Bennett points out, Spinoza usually uses the word ‘tempus’ to refer to measured time: ticks of a clock, for example. In a move comparable to the example of Letter 50, Spinoza argues that we invent time by comparing two distinct durations and abstracting a common measure.⁵² Again, if we treat these durations as real facts separable from eternal nature, we are reifying aids to the imagination. In other words, the attack on number and time is a consequence of the parts-regions distinction. Dugdale argues that ‘tempus’ always refers to detachable parts. He maintains that the categories ‘past,’ ‘present’ and ‘future’ risk turning time into detachable parts even without breaking it up into minutes and hours: “On my reading, Spinoza would say that the imagination, when it divides time into past, present, and future, mistakenly regards these as real distinctions, that is, mistakenly conceives of some times as if they could exist without the others” (2001c: 291). However, the fact that Spinoza rejects time as a mere aid to the imagination does not require that this aid has no foundation in reality. Our temporal concepts are imaginary when we treat time like independent pieces really distinct from eternity;⁵³ if, however, we treat time as a region within eternity, the problems disappear.

In his “Spinoza on Immortality and Time,” C. I. Hardin shows how we can regard tensed events as regions. He suggests that we turn to causation: “I would propose to ascribe to Spinoza a causal theory of time, in which temporal order is to be regarded as an appearance founded upon causal order, with temporal passage as the sensory (and hence confused) representation of that order” (1978a: 130). Spinoza believes that temporal ordering supervenes on the causal relations between finite modes. If the event x temporally precedes the event y, then there

⁵² “Furthermore, nobody doubts that time, too, is a product of the imagination and arises from the fact that we see some bodies move more slowly than others, or more quickly, or with equal speed” (E2P44S).

⁵³ For example, we are in error when we treat time as if it were made up of independent moments. Leibniz recognizes this conception of time behind Spinoza’s attack: “Are then time and measure composed of points? This seems to be given the nod, since it was said a little while ago that those who composed duration of points were in error because they have not distinguished between duration, which is real, from time, which is an imaginary entity” (LoC 111 L13).

must be some reason why x and y are not simultaneous, namely a cause that excludes x's presence at y. For instance, if x is the cause of y, then x must precede y.⁵⁴ Within this relational theory of time, past, present and future can never be conceived as detachable parts, for each one only exists in relation to all the others.

Hardin's theory helps to unify Spinoza's scattered comments on the temporal role of imagination. Early in the *Ethics* he asserts, "although things may not exist, the mind nevertheless always imagines them as present unless causes arise which exclude their present existence. Further, we have shown (P 18, II) that if the human body has once been affected by two external bodies at the same time, when the mind later imagines one of them, it will straightaway call the other to mind as well; that is, it will regard both as present to it *unless other causes arise which exclude their present existence*." (E2P44S italics mine). Later, he explains temporal order by referring to degrees of exclusion: "Insofar as we imagine a thing to be immanent or to belong to the near past, by that very fact we are imagining something that excludes the thing's presence to a less degree than if we were to imagine that its future time of existence was further from the present or that it happened long ago (as is self-evident). So to that extent we are more intensely affected by it" (E4P10dem).⁵⁵ Spinoza explains that imagining something present affects the mind more intensely than imagining something past or future; furthermore, imminent events affect us more intensely than events in either the distant future or the ancient past. This difference in intensity can be explained by the length of the causal chain between two events.⁵⁶ The longer the

⁵⁴ Hardin provides a more technical explanation of Spinoza's causal account of time: "Any two finite modal states A and B may be ordered with respect to one another according as A is the remote or proximate cause of B, B is a remote or proximate cause of A, or A and B either cause one another or have no causal relationship to one another. In the first case, we shall call A 'earlier than' B, in the second we shall call A 'later than' B, and in the third instance, we shall say that A is 'simultaneous with' B" (1978a: 131).

⁵⁵ Incidentally, perhaps this explains what Spinoza means by an idea being limited by another idea.

⁵⁶ Bennett follows Hardin in ascribing a causal theory of time to Spinoza; he explains this point nicely: "Spinoza takes the difference between (a) imagining x as temporally far away and (b) imagining x as temporally closer to be equivalent to, or based upon, the difference between (a') imagining something which greatly excludes x's presence and (b') imagining something which excludes x's presence less" (1984: 200).

chain, the less intensely we emote over an event. At a certain point, the lengths of the chain are indistinguishable to us, and so the difference in the degree of intensity caused by two different events becomes negligible.

Spinoza's causal ordering becomes a total ordering when we recall two of the central principles of *Natura naturata*: first, the conservation of motion-and-rest, and second, the definition of a complex individual. Combine these with his rigorous causal determinism,⁵⁷ and we have the face of the whole universe in four dimensions remaining eternally unchanged while containing an infinity of changes. Spinoza's infinite, eternal universe can be described with what Hardin calls 'nonrelativized Minkowski space-time diagrams.' Space-time diagrams were in use long before Minkowski designed his diagrams specifically to explicate Special Relativity, so Hardin's reference to nonrelativized Minkowski diagrams is anachronistic.⁵⁸ Nevertheless, space-time diagrams elucidate important features of Spinoza's metaphysics. On this interpretation, Spinoza's worm example takes on a double significance. Not only do we experience the universe in a fashion similar to a blood parasite, but when we appear in a diagram of the universe, our bodies take on the semblance of a four dimensional worm. In light of the temporal dimension, even entities like human beings can be described with the word 'region.'

Hardin emphasizes two important features of space-time diagrams:

Our diagram will exhaustively represent all the kinematic relationships among the modes, which is to say it will depict motion and rest insofar as they may be regarded as *extrinsic* determinations of bodies. We should notice two additional features of this representation. First, there is nothing in the diagram which is to be interpreted as temporal becoming. *Second, although sets of points within the continuum may be described as having temporal relations to one another, it would be downright misleading to describe the continuum itself as 'existing in time' or as 'existing at all times'.* (1978a: 131 italics mine)

⁵⁷ E1P33 and 35 make it explicit: "Things could not have been produced by God in any other way or in any other order than is the case"; "Whatever we conceive to be in God's power necessarily is the case." Leibniz holds a similar position, as he puts it in a note of 11 February 1676, "all things would exist if this were possible for them" (L 157).

⁵⁸ I owe this point to Dr. Arthur.

Hardin's first caution is a reference to McTaggart's A series, the moving now that supervenes on the static dating of events. Spinoza does not conceive of becoming as an entity that can be represented in a diagram as something over and above things that become. However, becoming still appears in our diagram as the sequence of causally arranged events.⁵⁹ Hardin's second point applies equally well to becoming: since the diagram already represents all four dimensions, we cannot describe the extent of its existence in temporal language without introducing a second type of time into the universe: we would have to measure the diagram against something that exists outside of it. This is impossible on Spinoza's monist ontology. Hence neither time nor duration (not even sempiternal duration) can explain eternal entities.

Arthur Lovejoy believes that Spinoza's ontology requires a more thorough repudiation of temporality. On his analysis, the necessity Spinoza attributes to every event in the universe precludes any temporal becoming whatsoever. He sees Spinoza's universe as a system of logical entailments that coalesce into a single unchangeable essence: "Whatever is true about an essence is true about it all at once; but what is true of the temporal world is not true of it all at once. Becoming and change, as such, simply do not fit into an eternal rational order" (1976: 295). Since temporal becoming is basic to our experience of the world, Lovejoy concludes that Spinoza's dismissal of it leads him to "inevitable and glowing inconsistencies." Spinoza, however, does not deny our experience of time. In his opinion, the way we experience becoming is an inevitable product of the causal structure of the universe. Hardin's account nicely explains how our experiences accord with Spinoza's ontology. Lovejoy's emphasis on what is 'true all at once' amounts to introducing another order of time into the universe.⁶⁰

Several commentators endorse arguments in favor of reading Spinozist eternity as either entailing or equivalent to sempiternity. Donagan and Kneale are the chief promoters of this interpretation, though Bennett also favors it. The principal reason for their position is Spinoza's frequent descriptions of eternal

⁵⁹ I am grateful to Dr. Arthur for pointing this detail out to me. I have criticized McTaggart's argument in my "McTaggart's Invention of Time."

⁶⁰ Curiously, Lovejoy does not level the same accusation against Leibniz.

things with sempiternal language. In several striking places, Spinoza ignores his own warning against describing eternity with reference to duration or time. For example, he writes “an infinite thing (Prs. 21 and 22, I) must always necessarily exist” (2P11D). And again, ““just as there is no beginning or end to [God’s] existing, so there is no beginning or end to his acting” (Preface 4, 321). Those in favor of a sempiternal account of eternity point to passages like these, arguing that the only thing that distinguishes the eternal from the sempiternal is necessary existence. Eternity entails sempiternity, for as Martha Kneale explains, “If we say that it is a timeless object, we must also say that it is a sempiternal object...because the only clear criterion for the existence of timeless objects is that any sentence which can be used to assert its existence must not require a device like tense or date but express a true proposition whenever, wherever, and by whomever spoken” (1973: 234). On this reading, Spinoza’s efforts to distinguish the eternal and the sempiternal amount to little more than special emphasis on necessary existence.⁶¹

Kneale points out the temporal language in Boethius’ analogy between the eternal God and a man standing on a mountain top, capable of seeing the whole road *at once*. Even if we ignore this oversight, a man who can see the whole road at once still cannot simultaneously see a traveler on the road in every position he will occupy: “The only way to evade the contradiction, as far as I can see, is to regard the traveler in Minkowski fashion as a four dimensional object, but then in order to account for *his* successive awareness, we have to postulate something like J. W. Dunne’s serial time and this involves a vicious infinite regress” (1973: 231). Kneale’s account is a little ambiguous – who does ‘his’ refer to? If she is referring to the traveler, his awareness of the present would be one of the features of the diagram, a part of the chain of ideas that parallels the chain of physical occurrences.⁶² If, on the other hand, she is referring to God, Boethius’ man on the

⁶¹ Donagan supports this reading, claiming that eternity is “necessary omnitemporal existence, understanding ‘omnitemporal’ as meaning ‘at all moments in the passage of time’” (1973: 244).

⁶² Kant offers an example of conscious substances communicating awareness in the same way that elastic balls communicate motion. By this analogy “we can conceive a whole series of substances of which the first translates its state together with its consciousness to the second, the

mountain, then her argument has little bearing on Spinoza. Unlike Boethius, who sees God as a personal being existing outside the world, Spinoza sees all such descriptions as hopelessly anthropomorphic distortions of the nature of God. For him, there is no one looking at the diagram in some otherworldly time; the diagram *is* all times, a necessary truth without duration.

Kneale rejects this final interpretation as well. She believes that $2+2=4$ has been true for a longer time today than yesterday. She remarks that this claim may be pointless, but it is not meaningless. It may be socially unacceptable to say that a necessary proposition is true on Wednesday, for such a statement may imply that the same proposition is not true on Thursday, but this does not mean that such a statement is untrue. However, this argument appeals to premises Spinoza would never accept. Whether or not Kneale believes that one can meaningfully say that a necessary proposition is true at a time, Spinoza considers such talk misleading; he recommends that we avoid it when we wish to speak accurately. Even though he did not consistently follow his own advice, his departures are usually explicable as explanatory devices. Kneale's argument against Spinoza begs the question, for she merely claims that her position is not his. Since he does not believe that duration is a fundamental feature of the universe, he would deny any claims that necessary truths have been true for longer on one day than on another. Manipulating language in order to permit such statements would not have appealed to him.

David Savan offers an alternative response to the argument. He points out that Kneale "fails to catch the distinction that Spinoza implies between the eternity and infinity of generative nature, of God, and the eternity of the universe, an infinite and eternal mode. According to Spinoza, the eternity of God (generative activity) does not entail that it is also sempiternal. It is only modes that are durational, and at P21 and 22 he argues that it is only in the case of the infinite modes that eternity entails sempiternity" (2001g: 369). Savan's

second its own state with that of the preceding state to the third, and this in turn the states of all the preceding substances together with its own consciousness and with their consciousness to another" (1929b: 342). There is nothing contradictory in this causal connection, so we have no need to appeal to another order of time to account for consciousness.

interpretation is plausible, despite the fact that it violates our earlier argument against describing the eternal *Natura naturata* with temporal language. This is because Savan's insight suppresses one dimension of our diagram, offering instead a three dimensional account of the infinite modes. Hence, he can claim that the eternal by the force of its cause exists at all times without submitting the eternal substance to temporal adulteration. So long as we conceive extension as three dimensional, we will envision a sempiternal universe; however, the sempiternal image omits the necessary structure of the causal and temporal order, making it easier to forget. Our four dimensional account more accurately models the Spinozist universe and does away with the need for any sempiternal account of eternity, except where such language will better facilitate the understanding of Spinoza's philosophy. Spinoza's frequent use of both kinds of speech was meant to serve the same purpose.

The alleged contradiction between Spinoza's claim that what is eternal cannot be described by temporal or durational concepts and the statement at 5P40C about "the part of the mind that survives" lies at the center of much of the eternal – sempiternal debate. Commentators often fail to note Spinoza's explicit acknowledgement that this manner of speaking is an explanatory device or an aid to the imagination. In 5P31S and 33S, he explains that he will speak *as if* temporal determinations belong to something completely unrelated to time: "to facilitate the explanation and render more readily intelligible what I intend to demonstrate, we shall consider the mind as if it were now beginning to be and were now beginning to understand things under the form of eternity...Although this love toward God has had no beginning (preceding Pr.), it yet has all the perfections of love just as if it had originated in the manner we supposed in the Corollary to the preceding Proposition". Spinoza's talk of the part of the mind that survives is no slip, nor does it necessarily require a change in the definition of eternity. Instead, it is a deliberate appeal to the imagination in order to clarify a difficult point.

Kneale and those who share her thesis tend to explain Spinoza's inconsistency as momentary slips. Bennett, for example, writes "If a stray denial

of duration to God does turn up, that will be because Spinoza has momentarily slipped, moving from (a) his official definition of ‘duration’ in terms which merely leave necessity out, to (b) a definition of it which includes contingency. But (b) is not his considered position” (1984: 207). This defense ignores Spinoza’s official definition of ‘eternity,’ which denies duration to eternal things. In fact, Spinoza’s official definition of duration states, “Duration is the indefinite continuance of existing. Explication: I say ‘indefinite’ because it can in no way be determined through the nature of the existing thing, nor again by the thing’s efficient cause which necessarily posits, but does not annul, the existence of the thing” (E2Def5). As we have seen, the essence of infinite substance involves existence, and therefore it would be contrary to Spinoza’s considered opinion to apply duration to God. Rather than accuse Spinoza of perpetually forgetting his own definitions, it would be better to pay closer attention to the tools he uses to clarify his position, especially when the alleged slips are more faithful to his position than the revisions offered by his commentators.

Summary

In this chapter, I have addressed two fundamental gaps in Spinoza’s explication of his monism. By carefully examining a wide range of texts, I have reconstructed Spinoza’s arguments for his definitions of ‘infinity’ and ‘eternity’ and shown how these arguments entail a relational theory of time. We have seen that Spinoza invokes three distinctions between types of infinity to attack the confusions he believes lead us into paradox and error. First, Spinoza divides the unlimited into two different categories: (i) the absolutely infinite substance, unlimited by its very nature, and (ii) the immediate and mediate infinite modes, which are unlimited only by virtue of their cause. Second, Spinoza differentiates the metaphysically unlimited from the mathematical infinite, in the process attacking the notion of infinite number as a perpetual danger to accurate understanding of the world. Third, Spinoza explains the dangers of imagination. He argues that aids to the imagination cannot reveal any true aspects of the metaphysical infinite, although these tools can further our understanding of the infinity of modes that the metaphysical infinite produces.

Building on the fundamental distinction between active *Natura naturans* and passive *Natura naturata*, we have seen why Spinoza divides the infinite into these three different categories. He defines the absolute infinite as completely without limit, and uses this conception to argue against both the Cartesian indefinite and the categorematic conception of infinite number. One of the earliest uses he makes of his conception of infinity is to argue against number, measure and time. Since number cannot accurately explain the nature of infinite substance, Spinoza concludes that it and all the concepts that make use of it are abstractions. He argues that these concepts are aids to the imagination derivative of human finitude, and not positive descriptions of reality. Spinoza therefore argues that eternity is the only ‘temporal’ concept that applies to the real universe, and posits a difference in kind between eternity and duration. Hence Spinoza denies a sempiternal account of eternity. The eternal parallels the infinite: eternal being is necessary being, absolutely unlimited. As Spinoza puts it, eternity is existence itself. Duration, on the other hand, even sempiternal duration, does not require necessary existence, and therefore cannot apply to substance or its infinite modes.

Although space-time diagrams are often described as static, such diagrams can explicate Spinoza’s account of temporality without denying the active force of *Natura naturans*. Spinoza explains that our temporal experiences derive from the causal relationships between different modes, but that all of these causal relationships depend fundamentally on the infinity of extension. Substance or active nature determines all of the variations in passive nature without any change in either the essence of active nature or the character of passive nature.

Recall again the division of Nature into *Natura naturans* and *Natura naturata*. Spinoza claims that extension is infinite and eternal by definition, and that the infinite modes are only derivatively so. We should bear in mind that the diagram is intended to represent *Natura naturata*, the passive result of ‘naturing’ nature. Further, as Hardin is quick to point out, Spinoza would see the diagram “as distortingly abstract and external because motion and rest are, in his view, not simply extrinsic determinations of bodies, but rather comprise the very essence of

individual physical things” (1978a: 131). Motion-and-rest, conceived as the immediate infinite mode of extension, must be distinguished from the motion of bodies; first, extension endeavours to persevere in existing, and it does so by deploying a whole host of bodies in motion. The motion of bodies occurs, as Bennett puts it, ‘one level up.’ Hence, our diagram depicts only this secondary motion, motion within the mediate infinite mode. We have identified the latter with the face of the whole universe in four dimensions; thus, our diagram represents the mediate infinite mode.

A great deal of Spinoza’s ontology escapes depiction in our diagram, but the diagram is intended only as an explanatory device for Spinozistic temporality; we should not expect it to capture every element of his system. We see that temporality, when properly understood, is a well-founded phenomena (to borrow a phrase from Leibniz) dependent on causation. Space-time diagrams provide a useful tool for describing Spinoza’s position. But in order to understand Spinoza’s philosophy, one must pay constant attention to the difference between aids to the imagination and adequate ideas, especially since Spinoza does not always clearly indicate shifts from one to the other. Many of the alleged contradictions in Spinoza’s concept of time appear when Spinoza shifts from a three plus one dimensional account of the universe to a four dimensional one.

Every event in our diagram is always the result of two causal factors: first, the infinite chain of physical causes that produce and destroy the actual mode, second, the direct causal force that originates in the absolutely infinite and upholds the essence of the mode. In fact, the endeavour central to each mode amounts to a region of this causal force. Spinoza argues that the universe has no need for a first cause in time so long as the whole series is upheld by something that necessarily exists. Because the whole series relies on self-causing substance, the paradox of an infinite regress disappears.⁶³ He concludes his “Letter on the

⁶³ Hence Spinoza rejects the position he takes in the *Metaphysical Thoughts*, where he argues that “if the world were to go backward again from this point of time, it could never have such a duration; therefore neither could the world have reached this point in time from such a beginning” (205).

Infinite” with a summary of the argument:⁶⁴ “Hence the force of this argument does not lie in the assertion that it is impossible for the infinite to exist actually, but only in the supposition that things which do not exist necessarily by their own nature are not determined to exist [unless]⁶⁵ by a thing existing necessarily by its own nature” (LoC: 115-7). The force of substance upholds an infinite regress within itself only because each mode expresses, in its own limited way, the essence of substance. As such an expression, every mode is eternal, for every mode is necessary in the same sense that our diagram is necessary: “In a word, in the same sense that God is said to be self-caused he must also be said to be the cause of all things” (E1P25S).⁶⁶ We only realize this when we begin to know God through intuitive knowledge. Through real knowledge of infinity, “we feel and we experience that we are eternal” (E5P23S).

III. The Development of Leibniz’s Philosophy of Time

Leibniz’s mature philosophy of time is the model of a relational theory. He treats time as the name for the relation of reason inclusion between different states of the universe. If a state α is incompatible with state β , and contains the sufficient reason for β , then α is earlier than β . If the state α is incompatible with the state β , and β contains the sufficient reason for α , then β is earlier than α . Finally, if the two states α and β are compatible, then α and β are simultaneous. Simultaneous states are described by spatial relations. While spatial and temporal relations apply to the real world (and can therefore be perfectly concrete), on their own they amount to nothing more than abstractions. These abstractions are continuous – that is, the whole exists prior to the parts, and the latter are produced by arbitrary mental divisions of any size. The real world, on the other hand, consists of determinate, discrete parts. Every body has unique boundaries that separate it from all others. A ‘whole’ made up of bodies is actually an aggregate

⁶⁴ This is one of the possibilities Crescas offers in his *Or Adonai*, where, interestingly, he argues that if one cause can produce more than one effect, “it must be admitted that the emanation of an infinite number of effects from one single cause would not be impossible” (1929a: 225). This has a striking resemblance to Spinoza’s argument for infinite attributes.

⁶⁵ Arthur points out that the ‘unless’ that Leibniz adds to his copy of the letter is necessary to convey the sense of this statement. See footnote 11 to his translation of Spinoza’s letter in *The Labyrinth of the Continuum*, p. 401.

– that is, the parts are prior to the whole. Leibniz believes that the labyrinth of the continuum appears when people confuse abstractions with reality.⁶⁷ This confusion easily arises, because the real world perfectly resembles a continuum. Leibniz contends that matter and motion are actually infinitely divided. Since the actual division of matter never reaches an end, every mental division we make in our measures will correspond with a division in the real world. In other words, the world obeys the law of continuity: ‘nature makes no leaps’.⁶⁸

Leibniz’s relational account of time and space breaks reality into several layers. Least real are abstract time and space, continuous measures expressing possible relations between bodies. Such abstractions can represent any possible situation, but they cannot represent the actual situation. Concrete space and time, on the other hand, are well founded phenomena: they are created by the determinate relations among real bodies. Bodies, however, only exist by virtue of the indivisible, immaterial substances with which they are always united. These substances provide infinitely divided matter with the cohesion it could not otherwise have. Each substance has an infinite series of perceptions. Every perception of the universe contains the entire state of that universe in a confused form. Together, these perceptions represent the whole sequence of events the universe will undergo. Substances consist in this sequence and the appetite or internal force that produces one perception after the next. Leibniz founds the temporal order in the monad: all perception is of bodies, and every perception contains the sufficient reason for its sequel. Apperception functions as the law of the series, knitting the discrete perceptions together into one whole by filling every gap between them.

Monads do not interact with one another. Instead, their appetites function according to a preestablished harmony that allows each monad to represent one

⁶⁶ Compare the statement at 1P18: “God is the immanent, not the transitive cause of all things.”

⁶⁷ On June 30, 1704, Leibniz reminds de Volder of the dangers of confusing the ideal and the real. If we take a geometrical abstraction such as a line, we can partition it at as many points as we choose; however, no matter how many points we begin with, we can never add them together to produce the line. When we forget that the line is an abstraction, we lose sight of the active constituents of reality: force and the motions it upholds.

universe according to its own point of view. Leibniz appeals to one of his favorite analogies: every substance is an eternal living mirror of the universe. Each monad reflects different aspects of the same universe, and its appetite orders these reflections so that they cohere with every other mirror. The perceptions generated by substances with incompatible appetites cannot converge on the same universe. Leibniz believes that a more diverse universe is a more perfect universe. God chose to create the most perfect universe possible. He examined every option and selected the universe in which an infinite variety of substances would behave in an exquisite harmony. The entire universe exists only by the free choice of a personal God, a being of a higher order again than all the monads he creates. God's attributes support every aspect of reality. Extended reality follows from divine immensity, temporal reality from divine eternity, and force or appetition from divine omnipotence.

Leibniz's mature philosophy of time and space is a dense constellation of concepts intertwined with the central tenets of his metaphysics. In order to arrive at it, Leibniz borrowed heavily from his predecessors and contemporaries. He examined their arguments, salvaged what he could and repaired the gaps with fragments scavenged from other systems. He always found a way to transform the positions he examined into beautiful elaborations of his own system. In *An Introduction to the Philosophy of Time and Space*, Bas C. van Fraassen argues that the origins of Leibniz's causal account of time lie in his sympathies for Aristotelian philosophy: "the question for him was: How can the Aristotelian account of *duration* be extended or generalized into an account of *temporal order*?" (1985c: 35-6). Van Fraassen lists several features common to both Aristotle's and Leibniz's theories, specifically (1) that duration is the quantity of motion, a measure of change with respect to before and after, (2) that change consists in one subject acquiring contrary predicates, and (3) that no object can have contrary predicates at the same time.⁶⁹

⁶⁸ For an excellent explanation of Leibniz's relational account of time, see Richard Arthur's "Leibniz's Theory of Time."

⁶⁹ Garber indirectly supports van Fraassen's thesis in his "Leibniz: Physics and Philosophy," arguing that Leibniz's relational theory of space belongs to the Aristotelian tradition,

While these three criteria are general enough to make almost any theory of time Aristotelian,⁷⁰ in his April 1669 letter to Thomasius, Leibniz admits that he is convinced by a great deal of Aristotle's arguments, including his conclusions about time: "For the most part Aristotle's reasoning about matter, privation, nature, place, infinity, time, and motion is certain and demonstrated, almost the only exception being what he said about the impossibility of a vacuum and of motion in a vacuum" (L 94). Although Leibniz wrote the letter to Thomasius very early in his career, well before he had formulated some of the key elements of his philosophy of time, he clearly endorses Aristotelian philosophy as his starting point. But a starting point is not a finish line and the path that leads from one to another can be a circuitous one, especially when it traverses the labyrinth of the continuum. In 1669, Leibniz accepted Aristotle's potential infinite as the correct account of infinity, and we shall see that he adopted syncategorematic interpretation in 1676.⁷¹ In the same way, Leibniz's relational theory of time involves serious revisions to the Aristotelian theory.⁷² The question, then, is what motivates Leibniz to revise and generalize Aristotle's position, and what considerations allow him to do so?

A complete answer to this question would lead as far away from the current discussion, so we will focus our attention on the most fruitful period of Leibniz's development: the last year he spent studying in Paris. During 1676, he formulated several key aspects of his mature metaphysics, including some major departures from the Aristotelian conception of time. He explored God's attributes, revising his understanding of divine immensity and eternity in light of a

where space is not something over and above things in space (see page 301). But this description is not entirely accurate, for Leibniz does distinguish space from things in space, he just doesn't allow the former an independent existence.

⁷⁰ Van Fraassen offers little evidence aside from these definitions.

⁷¹ Arthur argues that Leibniz's account of infinity always diverged from Aristotle's potential infinite, for even in his earliest writings he asserts the infinite actual division of matter: "Clearly, then, Leibniz's espousal of the actual infinite division does not have its origins in Aristotle, despite the obviously Aristotelian pedigree of his distinction between determinate and indeterminate parts" (1989: 183).

⁷² Van Fraassen points out that "Aristotle has simply taken temporal order for granted" (1985c: 14) and makes no attempt to define (or even discuss) simultaneity. These features lead van Fraassen to classify Aristotle's theory as a philosophy of duration, not one of time. Leibniz

hierarchy of infinities. He studied motion, and concluded that mind is necessary to unify any portion of matter, however small. After briefly flirting with substance monism, he reaffirmed his commitment to a plurality of substances each containing its own principle of action. His account of monadic appetition built on the newly discovered law of the infinite series to refute both monism and occasionalism. Indeed, this is only a fragment of his accomplishments during a period so precocious that Kulstad has called it unprecedented: “Leibniz’s Paris years perhaps deserve consideration as among the richest years of intellectual development and growth that a human being has ever experienced” (1999: 69).

Leibniz’s most productive intellectual period overlaps his first detailed study of Spinoza’s philosophy. While he had read the *Theological-Political Treatise* a few years earlier, he dramatically increased his knowledge of Spinoza’s philosophy after he met Walther Ehrenfried von Tschirnhaus in September 1675.

⁷³ Tschirnhaus was Spinoza’s most acute contemporary critic. The young German count arrived with a letter of introduction from Henry Oldenburg and immediately began collaborating in Leibniz’s studies.⁷⁴ Tschirnhaus quickly sought Spinoza’s permission to introduce Leibniz to the *Ethics*. He convinced Schuller to write Spinoza and tell him that Leibniz’s friendship would be an asset. In November 1675, Schuller passed the message to Spinoza: “[Tschirnhaus] finally concludes that he is a person most worthy of having your writings communicated to him, if your consent is first given; for he thinks that the Author will derive considerable advantage therefrom, as he undertakes to show at some length, if this would please you. But if not, have no doubt that he will honourably

treats neither temporal order nor simultaneity as basic indefinables; instead, he builds his relational theory of time from an extrapolation and generalization of Aristotle’s theses.

⁷³ In “Leibniz’s Paris Writings in Relation to Spinoza,” Parkinson reconstructs the chronology: Leibniz reads the TPT in 1671 when he receives it from Spinoza, but not too attentively, then he meets Tschirnhaus, who explains the *Ethics* to him in October 1675. This reinvigorates Leibniz’s interest in Spinoza, and at this time he takes his notes on the TPT. According to Parkinson, Leibniz more interested in Spinoza’s Bible scholarship than his philosophy; he notes that “when Tschirnhaus wrote to Spinoza that Leibniz ‘esteemed highly’ Spinoza’s *Tractatus* he was telling the truth – at any rate, as far as concerns the biblical criticism that the *Tractatus* contains” (1978c: 78). We shall see that Leibniz devoted as much attention to metaphysical problems he associated with Spinoza’s philosophy.

⁷⁴ Stewart reports that on some of Leibniz’s papers, both Leibniz and Tschirnhaus have added marginal notes.

keep them secret in accordance with his promise, just as in fact he has made not the slightest mention of them” (Ep. 70: 939).⁷⁵ Schuller goes on, on his own behalf, to encourage Spinoza to give Leibniz access to his works. We know Spinoza refused this request,⁷⁶ and yet Tschirnhaus provided Leibniz with a detailed and accurate outline of its contents a mere three months later. Not long after, Schuller sent Leibniz the “Letter on the Infinite,” which Leibniz recopied

⁷⁵ You can almost hear Schuller slap his head as he describes Tschirnhaus’ inept performance as a co-conspirator. When Tschirnhaus overheard people discussing the anonymously published TPT and wondering about its author, he gleefully announced that it was written by Spinoza: “To these...eager enquiries...Mr. Tschirnhaus has replied that he knows of none except for the ‘Proofs of the First and Second Parts of Descartes’ Principia’. Otherwise he said nothing about you except for the above, and hopes that this will not displease you” (Ep. 70: 938). Since the PCP was not published anonymously, Tschirnhaus’ admission reveals the author’s identity and defeats the whole purpose of withholding his name in the first place. Furthermore, Stewart observes that it would be hard for Tschirnhaus to know that Leibniz had written letters to Spinoza if he never discussed Spinoza with the uninitiated.

⁷⁶ Spinoza’s response of 18 November, 1675 displays his customary caution: “I believe I know Leibniz, of whom he writes, through correspondence, but I do not know why he, a councilor of Frankfurt, has gone to France. As far as I can judge from his letter, he seemed to me a person of liberal mind and well versed in every science. Still, I think it imprudent to entrust my writings to him so hastily. I should first like to know what he is doing in France, and hear our friend Tschirnhaus’ opinion of him after a longer acquaintance and closer knowledge of his character” (Ep. 72: 941). Since Leibniz traveled in the company of Baron Freiherr von Boineburg and kept the purpose of his trip secret (even from his family), Spinoza suspected a scheme intended to foster a reconciliation between Catholics and Protestants, a plan that, as James Martineau explains, “like all such schemes of union...involved not only mutual concessions on the part of approximating central sections, but joint repression of the extremes: and for this purpose a rigorous censorship of the press was proposed” (1883: 79). In order for the scheme to work, its proponents needed the support of Louis XIV’s government. Spinoza had already suffered from the publication and distribution of his *Theological-Political Treatise*, gaining a reputation as the evildest man in Europe. Only months earlier Spinoza experienced a bitter episode when he attempted to publish his latest book. In Ep. 68, he expresses his frustration as he tells Oldenburg about his decision to postpone publication of the *Ethics* indefinitely. Spinoza feared that Leibniz might use knowledge of the *Ethics* against him. Martineau surmises that Spinoza “will not show the *Ethics* to a man whose mission may be to get it suppressed” (1883: 79). For a number of condemnations of Spinoza and a discussion of censorship in Holland, see Jonathon Israel’s “The Banning of Spinoza’s Works in the Dutch Republic” in *Disguised and Overt Spinozism Around 1700*.

It is certainly possible that over the ensuing months Spinoza acceded to Tschirnhaus’ request. After all, he shows some trust in Tschirnhaus’ judgment, only asking that he wait until he has been acquainted with Leibniz for a longer period. Months pass between Spinoza’s response and the first indications that Tschirnhaus is sharing Spinoza’s system with Leibniz. However, we have no evidence of any direct communication between Leibniz and Spinoza between 1675 and the end of 1676, when the two met in The Hague. Objections written by Leibniz are passed on to Spinoza as if they were Tschirnhaus’ own, with no mention of Leibniz’s role in their discovery. Now Leibniz was not prone to shyness, as his earlier letter to a much more forthcoming Spinoza shows. Perhaps Tschirnhaus sends the objections in his own name because he was not yet permitted to share Spinoza’s philosophy with Leibniz, and had disregarded his obligation. The “Letter on the Infinite” and notes regarding it come from Schuller, not from Spinoza himself. One

and annotated extensively. Leibniz studied these notes in detail, applying new concepts to see if he could make any progress on his favorite conundrums. In some of the central writings on the continuum problem, he grappled with the same themes that Spinoza addresses in his *Ethics* and his “Letter on the Infinite.”

Towards the end of the year, Leibniz left Paris for Hanover, stopping in London and The Hague on the way. On his trip, Leibniz acquired several of Spinoza’s letters to Oldenburg and eventually met Spinoza, with whom he conversed “several times and for very long” (L 167). During the same period, he also received a more detailed summary of at least part of the *Ethics*, for the short essay “That a Most Perfect Being Exists” ends with a numbered list of propositions “for which a demonstration is needed” (L 168). The notes he received in February only explain the principal theses of the *Ethics*; in November he referred to propositions exclusively by number, even though he did not obtain a complete copy of the *Ethics* until after the publication of the *Opera Posthuma* in 1678. In his letters to Spinoza, Tschirnhaus also refers to propositions by number. This suggests that he not only possessed a more complete version of the *Ethics* than the summary he gives to Leibniz in February, but also that he gave of a copy of these notes to his friend before he left Paris. Otherwise, Leibniz may have obtained them when he arrived in The Hague. He spent several days there meeting with people who knew Spinoza and his work. By the end of 1676, Leibniz was in a unique position to reconstruct the position described in chapter one. He had access to almost all the texts I cited and was in direct contact with the author and his best students. In this chapter, I will reconstruct his appraisal of Spinoza’s work.

In the first section, I reconstruct the changes Leibniz’s understanding of eternity and immensity underwent after his collision with Spinoza’s metaphysics. I argue that Leibniz began with a sempiternal definition of eternity and no thoughts whatsoever about immensity. After he took notes on Spinoza’s *Ethics*, he introduced a hierarchy of infinity comparable to the distinctions Spinoza

wonders why Spinoza would send that old letter when he had nearly completed his *Ethics*, which, as we shall see, is crucial for an accurate understanding of the letter anyway.

presents in Ep. 12. Leibniz independently arrived at a syncategorematic definition of infinity by mid April 1676. Soon after, he received Spinoza's "Letter on the Infinite." He found many doctrines in it that coincide with his own, and the letter inspired further examinations of the definitions of immensity and eternity.

In the second section, I argue that the Spinozistic versions of the divine attributes contributed to Leibniz's emerging relational account of time and space. Leibniz examined relations between an essence and its properties, inventing and revisiting a number of analogies to explicate the nature of these relations. He argued that a comprehensive rule can arrange properties or attributes into a consistent structure. Infinite variety results when each of God's infinite attributes becomes the focal point of the relationships among all the rest. These analogies show Leibniz expanding his comprehension of the law of the series. While Mercer and Sleight have argued that these analogies contributed to the development of the preestablished harmony, we will see that some of Leibniz's 1676 applications of the analogies endorse Spinoza's substance monism. In fact, it appears that Leibniz moved away from the substance pluralism as he became more familiar with his analogies. While he later used his analogies to explicate monadic appetition, he arrived at this understanding only after detouring through Spinozistic territory.

This brings us to the third section. At the end of 1676, Leibniz composed a dialogue that brings together many of the new concepts he had developed during the year. Leibniz devised a first philosophy of motion which appeals to something which acts without changing. While the dialogue is ambiguous about whether there are substances or only substance, shortly after writing it Leibniz took up the problem of the subject of motion. He argued that without a centre of activity within each body, no individual can rightly be called an agent. Since all motion is relative, one can never determine that the motion of one body causes the motion of another. We can measure motion from a frame of reference in which our presumed agent is the patient and vice versa. Hence, the law of the conservation of quantity of motion cannot provide for truly active entities in the

universe aside from the whole universe itself. Since all motion is relative, it is conserved within the entire system, not within one individual body. Leibniz frequently appealed to Spinoza's philosophy to explicate this claim; he later argued that both the Cartesian and the Occasionalist responses to the problem of motion reduce to Spinozism. Leibniz used this insight to further his argument for the conservation of force within each individual, a conservation facilitated by the law of the series that governs monadic appetition. Thus, we will see that Leibniz's study of Spinoza provided an important impetus to his decision to rehabilitate substantial forms in 1677-8.

1. Immensity, Eternity and the Syncategorematic Infinite

Before Leibniz encountered Spinoza's philosophy, he accepted a sempiternal account of eternity.⁷⁷ He explored some of the ramifications of this conception in the December 1675 essay "On Mind, the Universe, and God". There, he equated eternity with an infinite line, inferring that the succession of time can generate eternity in the same way that the motion of a point can generate an infinite line. Since an infinite line has a midpoint, "there will also be a midpoint in eternity." This idea immediately provoked new questions about eternity. For example, if eternity has a mid-point, where are we in relation to it? Has the mid-point already passed? If so, how long ago? He observes that "when the midpoint of eternity comes, it can be said of God that half his life has passed" (DSR 9). Leibniz insists that "our affairs" occupy the middle instant of eternity, although he doesn't specify whether he is referring to human affairs in general or only to the events of the late seventeenth century.⁷⁸ Either way, his understanding of God differs dramatically from the conception Spinoza defends. Rather than denoting necessary existence, Leibniz treats the word 'eternity' as the greatest time or the longest duration. He explicitly defines it as such at the end of his notes on Spinoza's *Ethics* of February 1676: "the greatest of all successives is eternity" (LoC 43).

⁷⁷ We have seen that he endorses Aristotle's sempiternal understanding of eternity in 1669. See his letter to Thomasius, quoted above page 5.

⁷⁸ Either way, he implies that God is middle aged.

A unique midpoint is an unusual property for an infinite line, for one would expect that any point whatsoever could be designated the midpoint, making any discussion of a midpoint in eternity seem arbitrary at best. However, not all infinite lines are the same length: for example, lines unbounded on both sides are longer than lines unbounded on only one side. This detail inspired Leibniz to explore further the nature of infinite lines. In early April 1676,⁷⁹ he discovered an ingenious method to determine whether one unbounded line is longer than another. When we divide a line that is unbounded in one direction into two lines, one of these lines will be an unbounded line. According to the part-whole axiom, the original unbounded line must be longer than the unbounded line produced by the division. Using this method, we can determine the midpoint of a line unbounded on both sides. When we divide this line, two unbounded lines result. If the two pieces are the same length, the division is at the midpoint; otherwise, we can subtract finite line segments until the two unbounded lines are the same length.⁸⁰ In theory, then, one should be able to locate the midpoint of the universe and the midpoint of eternity. Nevertheless, Leibniz seems a little uncertain of his proof. He comments, “But the bisection of the plane and of the universe, and much more so their midpoints, are not equally certain” (LoC 73). The discussion breaks off soon after, without resolving the difficulty.

In some observations appended to the end of his first notes on Spinoza’s *Ethics*, Leibniz casually mentions that he divides the infinite into three classes: the mere infinite, the greatest in its own kind, and God. On the back of the same sheet of paper, Leibniz envisions beings which can be called eternal from the point of view of some lesser entity, even though they came into existence at some infinitely remote time.⁸¹ He argues that every entity is eternal from some perspective, and so eternity multiplies into something akin to unbounded lines of different lengths. Lines unbounded on one side can vary in length, so they belong

⁷⁹ See “Unbounded Lines.”

⁸⁰ Leibniz’s discussion owes much to his contemporaneous discovery of the calculus; insights from this discovery percolate throughout all of his subsequent work.

⁸¹ The introduction of different lengths of eternity resembles a claim made earlier in the Paris period: in “On Minimum and Maximum; on Bodies and Minds” of Nov 72 to Jan 73 Leibniz claims that “one point can be infinitely smaller than another” (LoC 15).

to the class Leibniz calls ‘mere infinites’. On the other hand, lines unbounded on both sides cannot be increased; therefore they belong to the class he calls ‘the greatest in its kind.’⁸² The hierarchy Leibniz announces in these notes closely resembles the one found in Spinoza’s writings; even the names of the categories comply with those offered in the *Ethics*.

In the contemporaneous “Secrets of the Sublime” (February 11, 1676), Leibniz subtly modifies his hierarchy of infinities: he replaces the phrase ‘greatest in its own kind’ with the word ‘immensity.’ Leibniz employs the concept ‘Immensum,’ to describe the absolutely indivisible unity associated with an attribute of God.⁸³ Whereas there are infinite quantities that are more or less than other infinite quantities, and these quantities are limited in one sense (from the point of view of greater infinites) and unlimited in another (from the point of view of lesser infinites), all infinite quantities need to be distinguished from the Immensum (which is to these lesser infinites as infinite number is to finite number):

if we imagine creatures of another world that is infinitely small, we will be infinite in comparison to them. When it is clear in turn that we could be imagined as being infinitely small in comparison with another world that is of infinite magnitude, yet bounded. When it is clear that the infinite is – as of course we commonly take it for granted – some thing other than the unbounded. This unbounded infinite should more properly be called the Immensum. (LoC 49-51)

The Immensum differs from the greatest in its kind in that the latter can be divided while the former cannot. Hence immensity differs from a line unbounded on both sides.

Leibniz utilizes immensity for the first time in February,⁸⁴ but it rapidly becomes a major feature of his metaphysics. In March,⁸⁵ Leibniz applies the term

⁸² See note 38, above. Hence every line unbounded on both sides is the same length and therefore, by the identity of indiscernibles, the same line. Leibniz avoids the argument that circles of varying diameters are different sized lines unbounded on both sides by denying that there is any such thing as a circle, as we shall see.

⁸³ The first mention of indivisible extension appears in the February notes, where Leibniz observes that for Spinoza, “Extension does not entail divisibility” (LoC 43). Leibniz does not refer to the idea as his own, although he does refer to extension as space conceived as “infinite in its own kind.”

⁸⁴ This statement needs qualification: the enormous number of unpublished notes makes it impossible to be absolutely certain that this is the first time he uses the term.

to clarify God's omnipresence. He explains that God, the unique, necessary being, cannot have parts. Anything with parts changes, and in a certain sense anything that changes is destroyed. Leibniz explains that space is only an aggregate of all simultaneous bodies. It is an accidental whole that amounts to nothing more than the arrangement of bodies in it. But at every instant, bodies move. Motion involves changes to the spatial organization of bodies; every motion, no matter how small, thereby renders an entire space extinct. God's indivisibility sustains the succession of spaces and times: "There is something in space which remains through the changes, and this is eternal; it is nothing other than the immensity of God, namely an attribute that is one and indivisible" (LoC 53). Earlier in the year, Leibniz equated the greatest in its kind with the whole of space;⁸⁶ soon after embracing the notion of divine immensity, he denies that there is any such thing as the whole of space. Instead, immensity serves as the foundation for bodies and matter, a necessary condition for the very possibility of spatial entities.

In April,⁸⁷ Leibniz describes 'absolute extension' in the same terms.⁸⁸ Parkinson explains: "He seems to regard absolute extension as the same as immeasurability,⁸⁹ and hence as a perfection of God. Absolute extension, he says, is the basis of space; it differs from space in that space is divided into parts and is changeable, whereas absolute space is indivisible and not changed, in that it is that which remains throughout changes" (DSR xxxv). Although absolute extension undergoes no change, modifications of it appear in the form of bodies. Leibniz claims that these result when bulk or mass appear in it, providing a foundation for concepts like spaces, places and intervals. His argument mirrors Spinoza's rejection of the passive extended substance Descartes identifies with body. The extended, or bulk, must be upheld by an active principle that modifies

⁸⁵ See the "Notes on Science and Metaphysics" of 18th and 2nd of March 1676.

⁸⁶ "For example, the greatest of all extended things is the whole of space" (LoC 43).

⁸⁷ See "On the Origin of Things from Forms"

⁸⁸ "Absolute extension... is a maximum and is indivisible... that space is supremely real, since it is God himself in so far as he is considered to be everywhere, or, is immeasurable" (DSR 77).

⁸⁹ Parkinson prefers 'immeasurability' to 'immensity' because he thinks the latter connotes 'very large'.

immensity and allows bulk to appear.⁹⁰ ‘Universal space,’ on the other hand, is the collection of all bulky pieces into a whole; it is ‘an entity by aggregation’ which has no existence alone, but only results from the sum of its parts.⁹¹

Leibniz uses indivisible extension to develop a new account of eternity. He concedes that indivisible extension entails the rejection of sempiternity. In the same way that God’s immensity cannot be divided, so “eternity is something indivisible, since it is the necessity of existing, which does not express succession, duration, or divisibility” (LoC 55). Eternity underpins the temporal features of the universe as immensity underpins bodies and space. Leibniz reverses this deduction in “On Magnitude,” tentatively dated to early 1676.⁹² There, he derives an unextended immensity from the definition of eternity: “It would suffice to note that Immensity corresponds to eternity, and that as eternity per se does not indicate succession, so neither does immensity indicate extension or parts” (A 484).⁹³ The greatest in its kind, reinterpreted as the indivisible nature of God, informs both conceptions.

The distinction between divine immensity and universal space (and also between divine eternity and universal time) depends on a new understanding of the infinite. In “Secrets,” Leibniz gravitated towards understanding immensity

⁹⁰ Leibniz repeats this claim in his letter to de Volder of June 30, 1704.

⁹¹ Parkinson points out that the notion of constantly changing space contains “the seeds of the famous account of the nature of space given in sec. 47 of the fifth paper to Clarke” (DSR xxxvi). There, Leibniz explains that space is the aggregate of all places, and place is only a certain relationship among bodies. Every motion produces a new space because every motion alters the relations between places.

⁹² Arthur observes that this resembles “On Substance, Change, Time and Extension” and “On Part, Whole, Transformation, and Change,” both of the early 1680s, and he argues that he would date it to 1679, save that it is possible that it contains connections to Leibniz’s Spinoza studies. Arthur notes a few things that seem to indicate Spinoza’s influence. First, Leibniz appeals to divine immensity as the source of space; second, he refers to separable time, a possible reference to Spinoza’s claim that time is composed of points (LoC 111). Note especially Leibniz’s comment that eternity is existence itself, almost a direct quote from Ep 12. However, in hindsight Arthur argues that “time as the magnitude of duration is common currency” and that “Leibniz has the immensity-as-the-basis-of-space stuff already in mid-March” (email Tuesday 7th of February 2006). Also, note that the separable time thesis is linked to the divisibility of extension, not a Spinozist idea. Nevertheless, Parkinson corroborates the earlier dating, assigning “On Magnitude” to early 1676, and Mercer and Sleight rely on the early date in their “Metaphysics: The Early Period to the *Discourse on Metaphysics*” and again in Mercer’s *Leibniz’s Metaphysics*. Given the definition of eternity, I would suggest that it was written after February, when Leibniz still espoused a sempiternal account of eternity.

⁹³ This is from an unpublished translation by Arthur.

through the categorematic interpretation of infinite number. He concludes that from the existence of different orders of eternity, “it will follow that there is an infinite number” (LoC 51). The efficacy of the new mathematics adds further support to this inference; he writes, “since we see the hypothesis of infinities and the infinitely small is splendidly consistent and successful in geometry, this also increases the likelihood that they really exist” (LoC 51). Although he expresses reservations later in the same paper, he continued to struggle with the idea until April 10th.⁹⁴

At the end of “Infinite Number” (April 10, 1676), Leibniz finally establishes to his own satisfaction the absurdity of the categorematic infinite. He realizes that he can treat the use of infinity in mathematics as an appeal to useful fictions. For example, a circle is a fictitious entity. A many-sided polygon approximates a circle; the more sides we add the more accurate our approximation becomes. The circle is only a name we give to the limiting case where the polygon has enough sides to reduce the error below any assignable: “polygons imitate the circle. And hence one may be said to come out of the other, by a[n]...abuse, as it were, of the imagination” (LoC 99). Fictions, then, allow one to determine a quantity to any desired degree of accuracy. In Leibniz’s opinion, this insight acquits the infinite of all the paradoxes indicting it. By adopting a syncategorematic interpretation of infinity, he can reconcile a powerful mathematical tool with the essential part-whole axiom, and bring together several of his metaphysical doctrines.

Leibniz offers an elegant argument against the categorematic infinite.⁹⁵ Assume an infinite number. Because any line contains an infinite number of points, for any triangle there will be as many points in the side as in the diagonal. But since the diagonal is longer than the side, “there will be no points in the difference between” the length of the diagonal and the length of the side, “which is absurd” (LoC 11). Hence he concludes that infinity is syncategorematic, and

⁹⁴ For the development of Leibniz’s account of infinity, see Arthur’s “Russell’s Conundrum” and the “Introduction” to *The Labyrinth of the Continuum*.

infinite numbers mere aids to the imagination. All things with an actually infinite number of parts succumb to this line of reasoning. If there is no such thing as an infinite whole, then an aggregate with an infinite number of parts is not one thing. Leibniz makes this point very succinctly: “it must be said that an infinity of things is not one whole, i.e. that there is no aggregate of them.” (LoC 101)

Leibniz encountered a similar line of reasoning when he receives Spinoza’s “Letter on the Infinite” a few days later.⁹⁶ This marks an intensification of Leibniz’s interaction with Spinoza’s philosophy. He not only recopies the entire text, but also makes an extensive commentary as long again as the letter itself. We have seen that Spinoza also advanced a syncategorematic interpretation of infinity; however, Leibniz finds Spinoza’s rather simplistic understanding of mathematics detrimental to the notion of the infinite. He repeatedly points out that where Spinoza writes ‘number’ he means ‘finite number.’ Spinoza reveals his ignorance when he argues that the fact that an hour can be divided into an infinite number of parts shows that an hour cannot elapse. This is shorthand for a larger argument,⁹⁷ but Leibniz disapproves of the careless statement of it given here. He observes that Spinoza’s description of the disjunct between infinitely divided tools like time and the continuous reality of duration fails to accomplish its goal, for he only proves that we can continue to divide an hour into smaller and smaller pieces. Leibniz remarks, “It does not follow from this, however, that an hour cannot pass, but that an hour can only pass in an hour” (LoC 109, L11).

Leibniz’s frustration culminates when Spinoza describes mathematician’s work on those things which exceed finite number as entirely unrelated to number. When Spinoza applies this interpretation to Descartes’ argument that matter is

⁹⁵ While he does not use it in “Infinite Number,” the argument given in “On Minimum and Maximum; on Bodies and Minds” is one of his favorites. He repeats it late in 1675 and again in October 1676.

⁹⁶ Assuming that Arthur has correctly dated the piece. He argues that although the paper is watermarked February 1676, the fact that Tschirnhaus sends Spinoza one of Leibniz’s objections to the “Letter on the Infinite” on May 2 indicates that Leibniz likely read the letter shortly before that date. Further, Leibniz sent a letter to Schuller on March 18th that does not mention Spinoza at all. In my opinion, watermark dating is not very convincing on its own. The fact that the paper was manufactured in February hardly proves that Leibniz wrote on it at that time.

⁹⁷ In fact, it is very much like Leibniz’s observation that we cannot add points together to produce a line. See note 67, above.

indefinitely divided, he states, “Yet [mathematicians] do not conclude that such things exceed every number because of the multitude of the parts, but because the nature of the thing cannot admit a number without a manifest contradiction” (LoC 111). Leibniz responds, “why shouldn’t they, if indeed it is obvious that they are more numerous than can bear an assignable number?” (LoC 111, L16). Leibniz critiques Spinoza’s reasoning, pointing out that Spinoza can only use Descartes’ example to show that even the smallest space contains an infinite number of actual divisions, not that numbers cannot apply to such spaces.⁹⁸ The identical objection appears in Tschirnhaus’ May 2 letter to Spinoza.⁹⁹

Despite these grievances, we should not overestimate the extent of Leibniz’s dissatisfaction with Spinoza’s metaphysics. A large part of the dispute over the status of infinite numbers is terminological. Recall that Spinoza refuses to abbreviate the syncategorematic infinite with the phrase ‘infinite number;’ he believes we should reserve the name exclusively for the categorematic infinite. Leibniz disagrees: he defends infinite numbers as useful fictions. They are tools

⁹⁸ “He had undertaken to show that this is not concluded from the multiplicity of the parts; but here he has shown only that it cannot be concluded from the magnitude of the whole, which is far different. Now it is evident that what is really to be concluded from this matter, which is divisible to infinity, is in fact so divided into all the parts into which it can be divided” (LoC 113, L17).

⁹⁹ Tschirnhaus writes, “For, in fact, in the case of such infinities all mathematicians always seem to demonstrate that the number of parts is so great as to exceed any assignable number, and in the example of the two circles which you adduce you do not seem to clear up this point, as you had undertaken to do. For there you merely show that they do not reach this conclusion from the excessive magnitude of the intervening space and ‘because we do not know its maximum and minimum,’ but you do not demonstrate, as you intended, that they do not reach this conclusion from the multitude of parts” (Ep. 80: 955). Spinoza does not recognize that a more nuanced position on infinite number is possible, namely reading infinite number as a number greater than any assignable. Thus, he responds, as he often does, by reiterating his position while offering very little new information. He argues that an infinite ‘number’ is not a number at all, for if it were, one could not hold that more matter exists in the whole than in the part. He writes, “If it were inferred from the multitude of parts, we would not be able to conceive a greater multitude of parts, but their multitude would have to be greater than any given number. That is not true, because in the entire space between the two non-concentric circles we conceive there to be twice the number of parts as in half that space, and yet the number of parts both in the half as well as in the whole of this space is greater than any assignable number” (Ep. 81: 956). Spinoza pushes Tschirnhaus to abandon talk about infinite numbers, and especially comparisons between numbers too great to assign. It seems unlikely that Leibniz would find Spinoza’s argument acceptable. As Arthur puts it, “I do not believe that Leibniz would have been persuaded by this reply, if he saw it. For it is hard to see how one multiplicity can be twice the other if no number is assignable to either of them” (LoC 401, n. 13). However, this dispute is mostly about language. Spinoza wants to avoid confusion by eliminating any reference to infinite numbers; Leibniz simply changes the meaning of the phrase.

that remain helpful so long as we carefully restrict the conclusions we draw from them. Spinoza concurs, at least in practice; however, in principle he has less faith in human memory, and so tries to completely expel the phrase from our vocabulary.¹⁰⁰

Levey¹⁰¹ points out the “uncanny resemblance” between Spinoza’s attack on confusion in the “Letter on the Infinite” and Leibniz’s later revelation that confusion produces the labyrinth of the continuum. Both Spinoza and Leibniz believe that the paradoxes of infinity result when we mistake the measure for the thing measured, but they disagree about the nature of each. For Spinoza, reality is continuous and measures discrete; for Leibniz, reality is discrete and measures continuous.¹⁰² Leibniz recognizes this difference, observing that Spinoza’s description of tempus in terms of detachable parts implies that time is something composed of moments. In spite of this disagreement, Leibniz enthusiastically endorses Spinoza’s contention that time is an abstraction. He rewrites Spinoza’s argument in his own words: we produce an abstraction “by conceiving duration as an entity through itself, abstracted from its own subject, in which use it would be, as he says, imaginary or a being of reason” (LoC 109, L10). After penning this description, he immediately recalls Hobbes’ analogous formulation.¹⁰³

Leibniz finds many other positive insights in the “Letter on the Infinite.”

¹⁰⁰ Evidently Spinoza’s has an inferior grasp of mathematical reasoning, especially when we compare him to Leibniz. However, we should not forget that many of the consequences Leibniz draws from the syncategorematic infinite grow out of his recent discovery of the calculus. For example, when Spinoza points out the difference between things that cannot be expounded by any number and things that cannot be equated with any number, Leibniz once again exclaims that this applies only to finite number, “for, if you apply infinite numbers (i.e. more than an assignable quantity of them), even irrationals can be expounded by a ratio of numbers to numbers” LoC 111, L14).

¹⁰¹ In his “Leibniz on Mathematics and the Actually Infinite Division of Matter”

¹⁰² McRae observes that when Leibniz proposes the opposite to what both Spinoza and Descartes conclude, he does so because he starts from different questions: “Leibniz inverts the order found in Descartes and Spinoza. For them time is the measure of duration. This difference arises from the fact that their conception of time begins with the consideration of the persistence of substances through change, while Leibniz’s begins with the consideration of change and events” (1994c: 110n1).

¹⁰³ To me, the wording of Leibniz’s observation sounds like a compliment. He declares that “this consideration strongly agree with Hobbes’” (LoC 109, L10). When Leibniz wrote to Hobbes in 1670, he repeatedly commends Hobbes’ insight. While to a certain extent, this was the expected style of such letters, Hobbes was a major influence on Leibniz’s development. As we will see, Leibniz’s earliest theory of motion grows out of a modification of Hobbes’ endeavours.

First, he agrees with Spinoza's division of infinity, and provides more detail about his own distinctions. Building directly on his February notes, he identifies three degrees of infinity: everything, maximum, and infinity. These correspond to the absolutely infinite, the greatest in its kind, and the infinite in the lowest degree, something that exceeds any assignable number. He claims that a line unbounded on both sides belongs to the second type of infinite, because it "contains every length" and so we can add nothing to it. These unbounded lines do correspond to an infinite that cannot be increased, for all lines unbounded on both sides are the same length; however, a line is divisible by definition, so it seems that he has either rescinded or omitted his contention that the second infinite is indivisible immensity. Unlike unbounded lines, numbers have no connection to the second infinite, because there is no number greater than every other number.

Despite the uncertain nature of the second infinite, the Immensum is very much a part of the hierarchy. Leibniz begins the discussion with the claim "I have always distinguished the Immensum from the unbounded" (LoC 115, L24). The word 'always' is puzzling, for the term first appears only a few months earlier, tied to infinite number. Leibniz receives the "Letter on the Infinite" after he writes "Infinite Number," so his concept of immensity is rapidly evolving away from the categorematic interpretation he relied on only a few months earlier. If Leibniz interprets the infinity of God's attributes the way Spinoza does, he would hold that by reason of their mutual implication, one attribute of God can just as well represent all of them. This coincides with the Scholastic notion of divine simplicity. On the other hand, Leibniz could interpret attributes as infinite after their kind, placing the attributes of God in the second category, but with a higher status than things like unbounded lines. As we shall see, Leibniz frequently relates that one attribute involves all the others; but both interpretations echo distinctions found in Spinoza's work and both confuse the distinction between infinities in a related fashion.¹⁰⁴ Perhaps this confusion is further evidence of the concept's novelty.

¹⁰⁴ In the March notes, Leibniz argues that each of the divine attributes be understood as parallel instantiations of the same basic features, namely an indivisible force underlying the phenomenal world. God is necessary for all things, and so every aspect of nature depends on one

Finally, some comments Spinoza makes at the end of the letter inspire Leibniz to apply his attack on wholes with an infinite number of parts to causation. He praises Spinoza's critique of an infinite causal regress, reiterating that although each term in the series has a sufficient reason in the previous term, this 'whole' series can never really be called a unity. Again, since an infinite number is only a manner of speaking, an appeal to an infinite causal regress is an appeal to an indeterminate situation, not a real thing. Leibniz writes, "since by this argument a series which contains the reason for those following does not have a determinate and definite magnitude, there will be no such series" (LoC 117, L25). If the series is infinitely long, one can subtract any individual cause, and indeed any series of causes, from the series without taking away the sufficient reason for the event; at the limit, one can subtract the whole series while leaving the sufficient reason for the event intact. Thus the series cannot be the sufficient reason for the event. He concludes that something exists independently of the series, namely a necessary being: "what is earlier in the series is not nearer to the Reason for the universe, i.e. to the First Being, than what is later, nor is the First Being the reason for the later ones as a result of the mediation of the earlier ones; rather it is the reason for all of them equally immediately" (LoC 117, L25). In other words, God is eternal in the sense that he is a necessary being unrelated to succession or duration, and he actively upholds everything in the universe.

Indivisible immensity and eternity become permanent features of Leibniz's relational account of space and time. In the dispute with Clarke, he contrasts immensity with absolute space and eternity with absolute time. Two features set immensity apart from absolute space: first, Leibniz contends that absolute space has parts, whereas immensity is indivisible;¹⁰⁵ second, immensity is not extended, but the force by which things can be extended. There are many parallels between Spinoza's and Leibniz's views. Schuller introduces Leibniz to

of the attributes of God: "In a word, just as in space there is something divine, the immensity of God itself, so in mind there is something divine, which Aristotle used to call the active intellect, and this is the same as God's omniscience; just as what is divine and eternal in space is the same as God's immensity, and what is divine and eternal in body, i.e. in a moveable entity, is the same as God's omnipotence; and what is divine in time is the same as eternity." (LoC 55).

¹⁰⁵ See the fifth paper to Clarke, section 51.

Spinoza's God by referring to him as an immense being. We have seen that for Spinoza, *Natura naturans* precedes the extended, which is only produced as a result of the immediate infinite mode, motion-and-rest conceived as conatus. Leibniz knows that Spinoza has an active view of immensity, for when Spinoza responds to Tschirnhaus' criticism he includes his attack on Descartes' inert extension. Although Spinoza does not provide all the relevant details, Leibniz understands enough of his conception of immensity to know that it agrees with his own. Leibniz first proposes immensity in the days surrounding his introduction to Spinoza's philosophy, and it emerges from the hierarchy of infinities Leibniz develops in conjunction with his exposure to Spinoza's ideas. These coincidences lend some weight to the suspicion that Leibniz derived his Immensum from Spinoza.

On the other hand, Leibniz does not record Spinoza's definition of eternity in his February notes, and ignores the word 'immense' in Schuller's summary. This seems odd, if he only adopted the idea a month earlier. Adams, however, points out that "quasi-spatial" immensity "was not an extraordinary view in the seventeenth century, though it was not uncontroversial" (1994a: 123). Among the proponents of divine immensity is Suarez, whom Leibniz read in his youth "with the facility as people are accustomed to read romance novels" (1985b: 264).¹⁰⁶ In today's Catholic Encyclopedia, divine immensity is an orthodox doctrine allegedly announced in the Athanasian Creed. The defendants of divine immensity belong to the Neoplatonic tradition.¹⁰⁷ In the section of the *Enneads* entitled "The Integral Omnipresence of Being," Plotinus identifies God or Being with "that which always is, existing always in the same way, which neither comes into being nor perishes, which occupies no region of space, neither a place nor some base, which neither goes out from some place nor again enters another, but

¹⁰⁶ See his *Metaphysical Disputations* 30, 7.

¹⁰⁷ Some of the many proponents of divine immensity include the thirteenth century theologians Alexander Neguam and Richard Fishacre, who employed immensity against the Cathars. For details, see Anne E. Davenport "The Catholics, the Cathars, and the Concept of Infinity in the Thirteenth Century". Closer to Leibniz's own time, Thomas Jackson, one of Clarke's students, defended divine immensity in his 1628 *Treatise on the Divine Essence and Attributes*. See Sarah Hutton, "Thomas Jackson, Oxford Platonist and William Twisse, Aristotelian."

which remains itself” (VI.5.10-16). He argues that Being cannot have parts, since parts entail change or becoming, the opposite of Being. However, the material world needs to participate in Being in order for it to exist, and this is only possible if Being is present in its entirety to every part of the material world.¹⁰⁸ In *Leibniz’s Metaphysics*, Mercer argues that Leibniz was steeped in the ‘Platonist’ tradition, so she believes that it is highly unlikely that Spinoza had any significant influence on Leibniz’s development.

Leibniz’s fluency with the Platonist metaphysics does not, however, immediately prove that Spinoza had nothing to do with his acceptance of immensity. Spinoza’s philosophy resembles the Platonist metaphysic in numerous ways. Wolfson believes that Spinoza’s definition of infinity as absolutely without limits shows the influence of Plotinus.¹⁰⁹ Spinoza’s identification of perfection with reality and power sounds like an adaptation of the Platonist tradition. While Spinoza’s polemic against emanation and final causality introduce some discrepancies into this reading, Leibniz may not have known all of Spinoza’s metaphysics prior to the publication of the *Ethics* in 1678. In the meantime, he had to rely on Tschirnhaus and Schuller – both of whom had strict orders about what they could and what they could not disclose about Spinoza. (Did Schuller refer to God as immense to disguise Spinoza’s heresy?) Throughout his commentary on Ep. 12, Leibniz compares Spinoza’s ideas to those of other thinkers, including Boethius, Hobbes, Digby, and Thomas White. Although Leibniz links Spinoza’s philosophy to Plotinus and Parmenides many years later, he does not list any other authors in relation to divine immensity, despite the fact that the concept appears frequently in papers where Leibniz works with ideas derived from Spinoza. Hence, even if we cannot say that Spinoza originally introduced immensity to Leibniz, the evidence suggests that Spinoza exposed him to its importance.

Spinoza’s work excited many ideas in Leibniz’s mind, not least by reminding him of the many other positions he had read in recent years. Numerous

¹⁰⁸ For an illuminating account of Plotinus’ argument, see John Scott Lee, “Omnipresence, Participation, and Eidetic Causation in Plotinus” in *The Structure of Being*.

¹⁰⁹ See note 22 in chapter II.

similarities between their two positions, including the syncategorematic interpretation of infinity, made it easy for Leibniz to borrow concepts from Spinoza. Leibniz's interaction with Spinoza's philosophy inspired him to write clear statements of his principles, some of which are the earliest records of the principles available. While Leibniz reports that the order of infinities is his own distinction, there is evidence to the contrary. First, the hierarchy does not appear in his earlier writings. Second, Leibniz's thoughts on the infinite are in flux throughout the Paris period. He wrestles almost constantly with the notion of a number of all numbers, both asserting and denying it in the very paper in which he first introduces divine immensity. It seems unlikely that he had finalized the structure of the hierarchy of infinities before he had decided how to interpret the word 'infinite.' As we will see below, Leibniz claimed that he 'always' considered extension a complex idea, even though he used it earlier in life as the paradigm of an unanalysable concept.¹¹⁰

While it may sound like mere conjecture to say that Spinoza's work instigates Leibniz's thinking about divine immensity, a plausible hypothesis can be constructed. Perhaps in one of Leibniz's many conversations with Tschirnhaus, the concept was mentioned in passing and Leibniz did not write it down. Indeed, given Tschirnhaus' obligatory silence on all things Spinoza in the early months of their relationship, this conversation may have been one in which Spinoza was not even named.¹¹¹ Something in the summary of the *Ethics* he writes in February rekindles the idea, and he makes a few short notes on the subject, but it is not really at the forefront of his mind until he encounters it again in Ep. 12. Leibniz may well have thought out certain similar ideas on his own, but found an occasion to elaborate on them in relation to his Spinoza studies. The appearance of immensity among Leibniz's concepts coincides with his new definition of eternity, and on at least one occasion he uses eternity to explicate immensity. As we have seen, Leibniz only began treating eternity as necessary

¹¹⁰ For example, in his letter to Thomasius he writes, "Who can imagine a being that partakes neither of extension nor of thought?" (L 100).

existence after his encounter with Spinoza's similar treatment of the concept.¹¹² Together, these coincidences suggest that Spinoza had an important impact on Leibniz's attempt to understand the relationship between God's attributes and his spatiotemporal world.¹¹³

2. The Law of the Series

In "On Magnitude" the relational account of time begins to emerge from the new definition of eternity. Leibniz explains the different orders of eternity in a fashion similar to his hierarchy of infinities. He again denies that sempiternity describes the essence of eternity: "*Eternity*, if it is conceived as something homogenous to time, will be a boundless time; but if it is an attribute of something eternal, it will be duration through a boundless time. But the true origin and innermost nature of eternity is the very necessity of existence, which indicates no succession per se, even if it should happen to coexist with everything that is eternal" (A 484). Leibniz tacitly denies his earlier attribution of a midpoint

¹¹¹ I owe this suggestion to a conversation with Arthur. Stewart supports it when he reports that later in his short life Tschirnhaus denied ever knowing Spinoza. Leibniz himself later observed that Tschirnhaus "was fond of stealing things."

¹¹² When he reads the *Ethics* in 1678 he finds himself in agreement with Spinoza's definition.

¹¹³ After I completed this section, it came to my attention that my hypothesis had received independent confirmation in Mogens Laerke's "*De Origine Rerum ex Formis*: a quasi-spinozistic parallelism in the *De Summa Rerum*." Laerke argues that the resemblance between Spinoza's indivisible extension and Leibniz's immensity, combined with the timing of Leibniz's adoption of the concept, make it likely the Leibniz derived his idea from his reading of Spinoza's Ep. 12. He analyses Leibniz's notes on the letter and several related texts, highlighting the similarities between Spinoza's absolute extension and Leibniz's immensity. Laerke writes, "As Spinoza's attribute of extension is unique, infinite, eternal and indivisible, so is Leibniz's *immensum*. As the attribute of extension in Spinoza, the *immensum* does not have parts, but only modifications. And finally, as the attribute of extension in Spinoza, the *immensum* is an attribute of God... Only Leibniz gives a less religiously scandalous flair to his *immensum* than Spinoza to his attribute of extension by assimilating the absolute extension to a traditional attribute of God: ubiquity or omnipresence" (2003a: 4). Laerke also recognizes the similarity between the two philosophers' divisions of infinity. While I have examined many of these texts in the above section, Laerke's commentary has the verve and confidence mine lacks. Laerke believes that Leibniz's preestablished harmony owes a great deal to his study of Spinoza. He has revised and improved his argument in his doctoral dissertation *La curiosité métaphysique. Leibniz et le spinozisme pendant le séjour à Paris (1672-76)*, although in my opinion the argument for Spinoza's impact on the divine immensity is better stated in the earlier piece. The latter work devotes more attention to other interesting aspects of Leibniz's commentary on Ep. 12. Laerke observes that many of Leibniz's comments, particularly those in the long L1, show that he is aware of many Spinozistic ideas not found in Ep. 12. Laerke concludes that Leibniz collaborated closely with Tschirnhaus: "En fait, nous sommes renforcés dans l'impression que ces annotations sont faites pendant une lecture en commun avec Tschirnhaus où Leibniz prend des notes, non seulement sur la lettre, mais également sur les commentaires qu'en propose son ami" (2003a: 116).

to God's existence, for God must be recognized as the only truly necessary entity in the universe. God coexists with everything sempiternal, but he does so without experiencing succession. Instead, God exists by definition, thereby apprehending the entire causal structure of his creation.

Leibniz indicates the relational structure of space and time when he defines simultaneity as the reciprocal reason inclusion between things:

Those things are *simultaneous* which can be sensed in one action of the mind. But since this action of mind has an extent, it must be seen whether we should not call those things *simultaneous* for which if one of them exists, the other exists. And this is readily acknowledged: if two things are of the kind that it is impossible for one to exist without the other, they are *simultaneous*. And doubtless if we were perfectly wise, i.e. gods, we would easily see that what seems to be accidentally simultaneous to us now, because of our ignorance, coexists by its very [nature], i.e. by the necessity of the divine intellect. (A 484)

By this definition, the experience of simultaneity involves the confused apprehension of the fact that the existence of one entity requires the existence of another. This is a core concept in Leibniz's relational theory of time, and no doubt the rest will soon emerge from it.

In fact, the mechanism that orders nonsimultaneous states appears diffusely in the same text. Leibniz introduces a method to determine which state follows directly from another: "A *rule* is an instrument for acting that determines a form of action, by a perpetual and successive application of the acting thing to the parts of the instrument" (A 493). Elaborating on his definition, Leibniz compares navigating with a compass to walking on a trail. While the former provides a reliable method for determining the direction one must travel, it neither indicates where one is nor tells one what the next step in one's journey must be.¹¹⁴ The compass is more like a law, which is unlike a rule "when the order of precepts is different from the order of actions, even though it is possible to derive from the precepts, by correct reasoning, the order of action" (DSR 39). By applying a compass to a map, one can determine the next step, but alone it only provides a precept.

¹¹⁴ This becomes important in the *Pacidius* where Pacidius asks Charinus to indicate not just any subsequent place, but the next place.

Mercer and Sleigh emphasize this definition of rule in their “Metaphysics: the Early Period to the *Discourse on Metaphysics*,” where they attempt to substantiate their suspicion that what they call the ‘production rule’¹¹⁵ or law of the series originates in Leibniz’s 1676 papers.¹¹⁶ They argue that divine omniscience, which Leibniz equated with active intellect in the March notes, begins as an external power imposed on mind from without, and slowly develops into an internal production rule specific to each substance. In this way, minds finally become active, and Leibniz solves the problem of motion that had been plaguing him since his earliest examinations in philosophy.¹¹⁷ We will see explore details of this transformation in the next section.

Mercer and Sleigh argue that the production rule emerges from a series of analogies Leibniz employs throughout 1676. First, in “On Truths, the Mind, God and the Universe” of April 15, 1676 (hereafter TMGU), Leibniz introduces God as a mind which thinks all things even though it “thinks nothing in particular” (LoC 65). Particular minds differ from each other and from God. For one thing, they have different sensations, and although these sensations are consistent with one another, they are not identical. No two minds can experience the world from the same point of view. Leibniz explains the difference between creatures and God with a numerical analogy: “Just as the number 3 is one thing, and 1, 1, 1 is

¹¹⁵ The distinction between a rule and a law explains why Mercer and Sleigh prefer to use the phrase ‘production rule’ to ‘law of the series,’ even though the latter makes the connection with Leibniz’s mathematical work more explicit.

¹¹⁶ This is a part of their argument that Leibniz has derived all of the essential elements of the preestablished harmony by April 1676. They identify three conditions that constitute the preestablished harmony: substances must be active, or completely responsible for their own states, behave in perfect harmony with one another, and do so without ever acting upon one another. The production rule fulfills the first condition. They claim that the earliest statement of the second condition, or principle of harmony, occurs in the February “Secrets of the Sublime”: “On February 11 1676...he first explicitly states his principle of harmony” (1995b: 95). He defends it as the principle of maximum essence: the principle of harmony demands that the most essence exist, and this is used to demonstrate that a supreme being must exist. As will be a constant theme in his work on Spinoza, Leibniz attempts to show that the supreme being is possible because it does not involve a contradiction. Leibniz claims that God has created things in such a way that he has no need of miracles to account for the harmonious arrangement of nature.

¹¹⁷ As Mercer and Sleigh point out, the moderns inconsistently labeled motion a property of body, even as they proclaimed that only God could be the cause of it. Leibniz’s attempt to solve this problem eventually leads to the ‘hypostatic’ union between active mind and the passive matter; together, these constitute the self-causing substance that expresses the world in a “confusedly omniscient and diffusely omnipotent” manner.

another – for 3 is $1 + 1 + 1$, and to this extent the form of the number 3 is different from all its parts – in the same way creatures differ from God, who is all things. Creatures are some things” (DSR 67). The concurrent sensations of all the minds in the world stand in spatial relations to one another. Spatial relations, founded on God’s immensity, serve as the form or order through which diverse sensory experiences can occur at one time.¹¹⁸ Mercer and Sleight argue that a nascent production rule, in this case an arithmetic one, explains how certain relations can transform diverse parts into a consistent whole. In the same way, spatial relations operate to transform diverse sensations into a world.

Their hypothesis is even more evident in the contemporary essay “On the Origin of Things from Forms” of April ? 1676 (hereafter OTF). If we recall Leibniz’s definition of mind as something that thinks from a particular perspective, we can interpret this essay as an explication of the rule or ordering of sensations specific to individual minds. God, who thinks all things, can consistently relate all minds in a way that allows their individual perceptions to represent different aspects of the same world. The sum of these aspects – the being that perceives them all – is God himself. Leibniz explains that the relationship among the parts of an expression differentiates one thing expressing the essence of God from another expressing the same essence. He writes,

¹¹⁸ Leibniz introduces a strange consequence to this definition of space: “from this it follows that infinitely many other spaces and other worlds can exist, in such a way that between these and ours there will be no distance, if there exist certain minds to which other things appear which are in no respect consistent with ours...there could be different laws of motion in that world” (DSR 65). While this is often read as a precursor to the notion of different possible worlds, Kulstad makes a case that it comes from Tschirnhaus’ interpretation of Spinoza’s belief that God has infinite attributes. Tschirnhaus argues that each attribute functions like a world entirely independent of this one, each with its own attribute of thought. His interpretation grows out of the failure of attribute parallelism if thought only expresses one attribute (extension) and not all of them. In his first notes on the *Ethics*, Leibniz copies down Tschirnhaus’ interpretation that thought is the privileged attribute as if it were Spinoza’s: “He thinks that there are infinitely many other attributes, besides thought and extension, but there is thought in all of them, as there is here in extension; but that we cannot conceive what they are like, each being infinite in its own kind, as, here, is space” (LoC 43). Kulstad argues that the other spaces actually exist, each corresponding with another of God’s attributes. Leibniz rejects this ‘many worlds’ view after a meeting with Spinoza, declaring, “To introduce another kind of existing things, and another world, so to speak, which is also infinite, is to abuse the word ‘existence,’ for we cannot say whether or not these things exist now. But existence as it is conceived by us involves some determinate time, or we say that a thing exists precisely if we can say about it at some definite moment of time, ‘This thing exists now’” (L 168). For an interesting look at the history of this idea from its appearance in March to its dismissal at the end of 1676, see Kulstad’s “Metaphysics à Trois”.

It seems to me that the origin of things from forms is of the same kind as the origin of properties from an essence; just as $6 = 1 + 1 + 1 + 1 + 1 + 1$, therefore $6 = 3 + 3, = 3 \times 2, = 4 + 2$, etc. Nor may one doubt that the one expression differs from the other, for in one way we think the number 3 or the number 2 expressly, and in another way we do not; but it is certain that the number 3 is not thought of by someone who thinks of six units at the same time... So just as these properties differ from each other and from essence, so do things differ from each other and from God. (DSR 77)

For each property of God, there is a unique expression of the divine essence; therefore, for each privileging of one property, there is a rule for generating the different arrangement of all the others.

Leibniz illustrates the different expressions by describing a city on a hill.¹¹⁹ There are an infinite number of different perspectives from which we can view the city, and despite the fact that the city has one unique plan, that plan can be expressed in an infinite number of profiles. By positing a substance for each point of view (and invoking the identity of indiscernibles), Leibniz populates the universe with an infinity of harmonious beings. According to Mercer and Sleight,

The difference among perspectives is worth emphasizing. The desired pictorial fecundity requires that each substance be distinctive: in order to maximize the variety of images, each substance must have a perspective that is different from every other. This means that no two perspectives will be similar and, hence, that no two substances will be the same. (1995b: 92)

Each substance, then, is an expression of the essence of God, but each expresses that essence in a different way. Mercer and Sleight contend that the production rule lurking in these analogies provides the foundation for the preestablished harmony, and hence of Leibniz's mature metaphysics.

Surprisingly, Mercer and Sleight argue that the development of the law of the series can have nothing to do with Spinoza, because Leibniz had neither seen the *Ethics* nor met Spinoza before November: "the philosophy of the *Ethics* could have no extensive influence on the development the preestablished harmony, and the related doctrines... since Leibniz neither saw a copy of the *Ethics* nor talked

¹¹⁹ But if the analogy with a city on a hill gives rise to the law of the series, it is remarkable that Leibniz used it as early as the letter to Thomasius. Perhaps this explains why Mercer, in her *Leibniz's Metaphysics*, contends that the preestablished harmony arose even earlier than 1676.

with its author about it until November, 1676” (1995b: 126n44).¹²⁰ While they qualify this claim with an acknowledgement that Leibniz had some exposure to Spinoza’s ideas, their account leaves out entirely the extent of Leibniz’s earlier knowledge of Spinoza, both as an expositor of Descartes mentioned in the 1669 letter to Thomasius,¹²¹ and as the author of the *Theological-Political Treatise* which he received from Spinoza in 1671. In fact, throughout the Paris period Leibniz dialogued with both Schuller and Tschirnhaus, attempting to learn as much as he could about Spinoza. We have seen that he has acquired a detailed summary of the themes of the first two books of the *Ethics* by February 1676, and continued to search for a complete copy. By the end of April, he had read the “Letter on the Infinite” and written a detailed commentary on its contents. As we have seen, Tschirnhaus forwarded these comments and objections to Spinoza himself.

Mercer and Sleight even ignore the references to Spinoza throughout Leibniz’s 1676 papers, including the Spinozistic language in the analogies themselves. In the TMGU, Leibniz interacts frequently with ideas he recorded in his February notes. He endorses Spinoza’s decision to start with God and critiques his theory of mind. In both the TMGU and the OTF, Leibniz introduces the analogies to describe how we can derive multiple perspectives and properties from an essence. He does not always employ them to describe how individual substances relate to the universe. Instead, he often interprets the analogies through a monist view of the universe. The numerical analogy explains how multiple properties or modes can emerge from one essence, while the city analogy explains how we can recognize a single essence underneath the privileging of any

¹²⁰ See her larger argument in *Leibniz’s Metaphysics*, where she claims that the Spinozistic sounding language is really Platonist language. She believes that scholars place too much emphasis on a few quotations taken out of context and strung together: “Once we stand back and survey the vast expanse of Leibniz’s erudition and the full array of his interests during the time, we should not be surprised to discover among his many papers, and especially his personal notes, a number of vague and misleading comments or a tendency to try out the terminology of the other side” (2001d: 458). Of course, this does not excuse her from ignoring Leibniz’s interaction with Spinoza’s thought, though it seems to be her preference.

¹²¹ The *Principles of Cartesian Philosophy* may have been one of Leibniz’s major sources for his early understanding of Descartes, for he writes to Simon Foucher in 1675 that he learned Descartes from secondary sources had not yet made the time to study his works in any detail. As we have seen, Leibniz consistently refers to ideas Spinoza emphasizes in his commentary.

one property of that essence. Leibniz even considers God all things, a statement heavy with Spinozistic implications.

While we can obviate the Spinozistic connotations in Leibniz's remark that "God is all things; creatures are some things" if we treat it like a poor statement to the effect that God is the sufficient reason for all things,¹²² certain statements are beyond repair. Leibniz employs the city on a hill analogy again in November,¹²³ explicitly identifying the points of view not with substances, but modes of substance. The parallel between Leibniz's conclusions here and those Spinoza promotes make it worth quoting this passage at length:

It can easily be demonstrated that all things are distinguished, not as substances (i.e. radically) but as modes. This can be demonstrated from the fact that, of those things which are radically distinct, one can be perfectly understood without another; that is, all the requisites of the one can be understood without the requisites of the other being understood. But in the case of things, this is not so; for since the ultimate reason of things is unique, and contains by itself all requisites of things, it is evident that the requisites of all things are the same. So also is their essence, given that an essence is the aggregate of all primary requisites. Therefore the essence of all things is the same, and things differ only modally, as a town seen from a high point differs from the town seen from a plain. If only those things are really different which can be separated, or, of which one can be perfectly understood without the other, it follows that no thing really differs from another, but that all things are one. (DSR 93-5)

This essay displays marked similarities with April's TMGU and OTF; it uses the same analogies to explain how infinite variety can emerge from unity.¹²⁴

¹²² Parkinson does just this in "Leibniz's Paris Writings in Relation to Spinoza": "the assertion that God is all things really means that God is the sufficient reason of all things – a proposition which, in Leibniz, has no pantheistic implications" (1978c: 88). However, Kulstad argues that if we read Leibniz's account literally, it supports Parkinson's contention that God is the sufficient reason for all things; however, if we read the first sentence literally, we should read the next one in the same way. When the second clause is "read in this literal way also, we would seem to get the reading that God is the subject whose essence contains all things as properties of God – something it is hard to see as having no pantheistic (or Spinozistic) implications" (1994b: 426). Kulstad continues, "Reading between the lines... we can easily believe that Leibniz is saying here that God's essence is the essence of all things, and that it follows from this that the things of our experience are not separate substances at all, but rather modes or properties of God, contained in God's essence" (1994b: 427-8)

¹²³ In "That a Most Perfect Being is Possible"

¹²⁴ Parkinson cannot deny the Spinozist trend of this piece: "The conclusion of the argument is strongly reminiscent of Spinoza. It was perhaps this fact which lead Leibniz to abandon the paper after a few more lines" (DSR 137 n.4). Leibniz discontinues the essay with a disquieting affirmation that metaphysics needs to conform to accepted opinions – perhaps it was the fact that his thoughts were leading him away from orthodoxy that prompted him to give them

Strangely, Leibniz invokes the analogy with the city on the hill to explain that things are not substances, despite the fact that the various perspectives could be taken to imply subjects that have those perspectives. One would expect a pluralist like Leibniz to jump on a chance to explain the need for minds in matter; instead he chooses to deny the pluralism at the heart of his mature metaphysics.

Mercer radically revises her account of Leibniz's invention of the production rule in her *Leibniz's Metaphysics*. She now contends that Leibniz had adopted the Preestablished Harmony as early as 1672. She posits a number of Platonist assumptions guiding Leibniz's thinking throughout his philosophical career, and she shows how one can discover Leibniz's entire metaphysics in his earliest essays if we interpret them with his basic assumptions in mind. She admits that Leibniz had some awareness of Spinoza's philosophy in 1676, but she still maintains that Spinoza had no influence on Leibniz's thinking, even if he was "shocked and enthralled by Spinoza's metaphysical proposals" (2001d: 387). In her opinion, Leibniz's metaphysics had almost reached its mature state long before he encountered any of Spinoza's thought.

Unfortunately, the assumptions Mercer proposes would make it impossible for Leibniz not to arrive at his mature system almost as soon as he becomes aware of their consequences. She even admits this at times, pointing out that by 1669 he has all the principles from which the majority of his mature metaphysics follows.¹²⁵ She explains that "it is important to realize how thoroughly Leibniz's hands were tied" when he began to elaborate his well-founded phenomenalism in 1671 (2001d: 313). I submit that the ropes tying Leibniz's hand are not his own, but rather a product of Mercer's dubious commitment to the belief that changes of opinion result from a capricious

up: "A metaphysics should be written with accurate definitions and demonstrations, but nothing should be demonstrated in it apart from that which does not clash too much with received opinions. For in that way this metaphysics can be accepted; and once it has been approved then, if people examine it more deeply, they themselves will draw the necessary consequences. Besides this, one can, as a separate undertaking, show these people later the way of reasoning about these things. In this metaphysics, it will be useful for there to be added here and there the authoritative utterances of great men, who have reasoned in a similar way; especially when these utterances contain something that seems to have some possible relevance to the illustration of a view" (DSR 95). I'm sure Bertrand Russell would have enjoyed this quote.

¹²⁵ See her (2001d: 98)

personality. She wants to eliminate any impression of “juvenile indecision” in his earliest writings (2001d: 17) because she believes that interpretation “sheds virtually no light on the motivations behind Leibniz’s metaphysics” (2001d: 7). The events of 1676 throw paint all over such a static portrait of Leibniz. We see him constantly modifying his position, trying out new ideas as often as he comes upon them. The ‘rhetoric of attraction’ may be a major feature of the pieces he wrote for an audience, but it seems unlikely that Leibniz would avoid discussing his most fundamental principles in papers he wrote only for himself.

Mark Kulstad’s recent work suggests a more discontinuous path to Leibniz’s development.¹²⁶ For our purposes, we will focus on his exploration of the relationship between numerical and city analogies and Spinoza’s philosophy. He believes that at least some of Leibniz’s 1676 writings represent “a creative response” to the Spinoza studies he and Tschirnhaus had undertaken over the course of the year. Kulstad examines an exchange of letters that began on January 5, 1675, when Tschirnhaus attacked Spinoza’s rather vague account of how infinite modes follow from the attribute of extension considered alone. Tschirnhaus asks Spinoza for “the true definition of motion, together with an explanation. And since extension conceived through itself is indivisible, immutable, etc., how can we deduce a priori the many and various forms that it can assume, and consequently the existence of figure in the particles of body, which yet are various in any body and are different from the figures of the parts which constitute the form of another body?” (Ep. 59: 911). Kulstad points out a specific and a general problem contained in this question: Tschirnhaus demands to know the source of (a) variety in bodies, given indivisible extension and (b) variety in things, given any one attribute.

This letter predates Tschirnhaus’ friendship with Leibniz, but related problems occupy his mind when he summarizes the *Ethics* a few months later.¹²⁷

¹²⁶ We will be drawing on three essays: “Did Leibniz Incline Towards Monistic Pantheism in 1676?” (1994b); “Leibniz’s *DE SUMMA RERUM*. The Origin of the Variety of Things, in Connection with the Spinoza-Tschirnhaus Correspondence” (1999); and “Metaphysics à Trois” (2002b).

¹²⁷ In particular, Tschirnhaus questions the privileged role for the attribute of thought, and raises problems with attribute parallelism given this privilege.

Spinoza simply ignored the request until it was reiterated after Leibniz and Tschirnhaus became friends.¹²⁸ Tschirnhaus repeats the question in Ep. 80 of May 2 1676 (where he also raises Leibniz's objection to Spinoza's use of the nonconcentric circles example, above), and again in Ep. 82 of June 23, where he adds significant new details.¹²⁹ Kulstad draws our attention to these details. Tschirnhaus points out that he can only derive one property from a given mathematical definition without relating it to other things with other definitions.¹³⁰ Since Tschirnhaus cannot conceive of more than one property following from a single definition, he feels that extension cannot produce its own modes. Instead, he insists that extension would be the same inert mass that Spinoza rejects in the Cartesian account. To avoid this result, Tschirnhaus offers Spinoza a way out: it could be that the relations of all the attributes to one another produce the infinite variety we experience around us, and all the modes of a given attribute result when it becomes the focal point of the relations with the other attributes. But if this is the case, Tschirnhaus wants some explanation of the details.

Kulstad points out that the solution Tschirnhaus offers to Spinoza comes directly from Leibniz's work on the numerical and city analogies.¹³¹ We can

¹²⁸ In "Leibniz's Paris Writings in Relation to Spinoza," Parkinson also notes Tschirnhaus' return to the objection after his conversations with Leibniz.

¹²⁹ Spinoza first replies to the question as if it pertained to Descartes' account of extension (Ep. 81, quoted above ch. 1), and when Tschirnhaus presses his advantage, demanding Spinoza's own account of the matter, Spinoza admits that he has not yet arranged his thoughts on the issue "in the proper order". He died before he had the chance. Nevertheless, Spinoza's response is not quite as vacuous as Kulstad would have us believe: Spinoza points out that from the definitions of 'most simple things' and aids to the imagination, such as the mathematical definitions Tschirnhaus suggests as examples, it may be possible to derive only one property, but the definitions of real things are considerably richer. He then offers several properties deduced from the definition of God as "an Entity to whose essence existence belongs" (EP. 83: 958), including singularity, immutability, and infinity.

¹³⁰ He claims that this undercuts E1P16: "From the necessity of the divine nature there must follow infinite things in infinite ways, that is, everything that can come within the scope of infinite intellect," which he claims is "almost the most important proposition in your whole treatise" (Ep. 82: 957).

¹³¹ Strangely, Kulstad's hypothesis is somewhat self-refuting. He points out the gap in the congruence between the DSR and Tschirnhaus' letter: "The possible exception is the matter of only one property being deducible from a definition. I do not know of any place where Leibniz says this. Indeed, my view is that it would not agree well with Leibniz's views on definition" (1999: 74n18). This exception is the crux of the argument, for if one can deduce more than one thing from a given definition, why would Leibniz need to answer the question, and why would he

easily imagine how this could come about. As Tschirnhaus and Leibniz conversed about Spinoza, Tschirnhaus gave Leibniz not only a summary of the *Ethics*, but also his interpretation and criticism of it.¹³² The two attempted to resolve the tensions they found within the system by testing out various alternative interpretations of the propositions, trying to give it the most charitable reading possible. Even if Leibniz was unlikely to do this on his own, we should not forget that Tschirnhaus is a convert out to defend at least the major thrust of what he took to be Spinoza's position. Leibniz shows his high opinion of Tschirnhaus' reasoning in the *Pacidius*, where he allows a character modeled after the young man to solve (with some help) a cluster of intractable problems concerning the philosophy of motion. Leibniz and Tschirnhaus likely devoted a great deal of time to collaborative study, and we have no reason to believe that every time Tschirnhaus used a Spinozistic principle, he admitted it as such to Leibniz.¹³³ Kulstad contends that within this context Leibniz learned of Tschirnhaus' objection and developed a solution to it by reconsidering his numerical and city analogies.

Shortly before Tschirnhaus sends Ep. 82, Leibniz writes something resembling the solution Tschirnhaus suggests. In the TMGU, Leibniz considers the infinite attributes of God as independent aspects of God's ultimate essence. He contends that every mode must involve God's ultimate essence, not just an aspect of it. Since every mode, no matter how small, is infinitely actually divided,

dispute with Spinoza in favor of it? In fact, Leibniz does not think that only one property follows from a definition, as he makes clear in a letter to Tschirnhaus in May 1678: "We must realize, indeed, that there are several definitions of the same thing, that is, reciprocal properties which distinguish one thing from all other things and that from each one we can derive all the other properties of the thing defined" (L 194). If Leibniz means by this that we can apply various permutation rules to the definition of a thing to derive all the reciprocal properties of that thing without appealing to anything other than laws of logic, then it seems that he is both reiterating the solution proffered to Spinoza and denying that anything needs solving. The example itself shows that multiple properties can be inferred from one definition. The question now concerns the length of that definition, since substance has infinite attributes and indeed must have them in order to sustain the infinite actual divisions found everywhere in nature. In neither the notes attached to "That a Most Perfect Being Exists" nor the notes he wrote on the *Ethics* in 1678 dispute E1P16.

¹³² While Friedman has accused Tschirnhaus of giving Leibniz a poor description, in his "Leibniz's Paris Writings in Relation to Spinoza," Parkinson shows that Tschirnhaus' summary is accurate and discrepancies between it and the Spinoza's text rest on the criticisms found in Tschirnhaus' letters to Spinoza.

¹³³ See note 104, above.

every mode involves an infinite series. All infinite series must be grounded in God's ultimate essence, considered as the union of the infinite attributes.¹³⁴ "But an infinite series results only from infinite attributes. But when all things are related to one attribute, there result modifications in that attribute; hence it comes about that the same essence of God is expressed in any genus of the world in its totality, and so God manifests himself in infinitely many ways" (DSR 69-71).¹³⁵ Leibniz introduces the numerical analogy to explain the relationship among attributes and the essence they express. If six is the essence of God, there are several ways one can combine the attributes to express that essence. Each of the expressions contains a unique rule that will generate the whole essence from a combination of other attributes. Given the fact that God's essence is infinite (and so not like a finite number such as six), there are infinite ways to express that essence, and therefore infinite attributes of God. Indeed, Leibniz considers infinite attributes a prerequisite for any infinite causal sequence and also for any modification appearing in an individual attribute. If we put the pieces together, we uncover a definition of God very close to Spinoza's: God is a necessary being with infinite attributes, in whom are an infinite number of modal variations or things.

According to Kulstad, both the numerical analogy and the city on a hill exemplify the 'pure relations theory'. On this account, Leibniz has no need of substances in order to explain how variety arises from the attributes of God;

¹³⁴ There is an interesting similarity here between Leibniz's argument and Cantor's claim that an infinite range (like the syncategorematic infinite) requires an infinite domain (the transfinite). Leibniz skips the intermediary infinity, grounding range of his syncategorematic infinite in the domain of God's hypercategorematic infinity.

¹³⁵ While one may object that Leibniz and Spinoza don't mean the same thing by 'attribute,' Kulstad points out that the definitions need not be identical, "since the main focus is on Leibniz's reactions to what he understood to be Spinoza's view (2002b: 229) and thus not necessarily the views of Spinoza himself. But he enumerates some similarities in the meaning the two assign to the word 'attribute': "Both take an attribute to be something that expresses what it expresses without any negation or limitation (1d6; L: AvIII, 513, 519-20, 572, 578). And both view an attribute as conceived through itself (1p10; L: AvIII, 514-15, 574)" (2002b: 235n14). Against Kulstad, we should note Leibniz's dislike for Spinoza's definition of an attribute; in 1678 he writes, "For the question arises whether he understands by attribute every reciprocal predicate, or every essential predicate whether reciprocal or not, or finally, every primary essential or indemonstrable predicate of substance" (L 197). After reading the definition of mode, he claims that "the obscurity of Definition 4 disappears" (L 197), yet in his examination of proposition 2 he

instead, all variety results from the relations among the attributes themselves: “If we follow the analogy, then nothing else is needed for the origin of things other than the relation of attributes, taken singly, to all attributes taken together. No additional sort of entity needs to be brought into the explanation” (1999: 80). Kulstad acknowledges that this is a somewhat sketchy reconstruction, and that Leibniz may not have all the details worked out at this point.¹³⁶

Kulstad contrasts the ‘pure relations theory’ with the ‘subjects theory’ which differs from the pure relations theory by adding subjects to the relationship among attributes, and deriving variety from a much larger set of entities. Clearly Leibniz makes claims to this effect in the texts. For example, in April’s “On Simple Forms” he writes,

Things are not produced by the mere combination of forms in God, but along with a subject also. The subject itself, or God, together with his ubiquity, gives the immeasurable, and this immeasurable combined with other subjects brings it about that all possible modes, or things, follow in it. The various results of forms, combined with a subject, bring it about that particulars result. I cannot explain how things result from forms other than by analogy with the way that numbers arise from units – with this difference, that all units are homogenous, but forms are different. (DSR 85)

Mercer and Sleight defend the subjects theory throughout Leibniz’s work:

“Particular substances arise when the combinations or modifications of these forms are instantiated in a subject” (1995b: 96). Kulstad argues that this is tantamount to assuming what was to be proven: namely, a variety of things (or minds) providing the basis of variety. But such circular reasoning is of little use, and so Kulstad suspects that Leibniz must have at least considered the ‘pure relations theory’ at some time in 1676, although the acceptance was short lived.

again takes issue with the definition of attribute, and again in proposition 5. Both these propositions claim to show that there are no shared attributes among substances.

¹³⁶ Adams offers a similar interpretation, “Behind the argument, however, is clearly the idea that we saw in other passages, of derivative things resulting from the relations, or logical interactions, so to speak, of all the divine attributes” (1994a: 130). Mercer and Sleight, on the other hand, believe that these papers “depend on certain difficult neo-Platonic and Aristotelian doctrines. Fortunately, we need not bother with the complicated details” (1995b: 96). Adams notes that throughout 1676 Leibniz makes no effort to show that things exist in a fashion distinct from God. Mercer responds with ‘why would he?’, pointing to Leibniz’s Platonist heritage as proof that he cannot defend what Adams takes as the only way to avoid Spinozism: for the

He follows Adams in arguing that April's 'subjects' paper "signals Leibniz's rejection of the monistic point of view" (1999: 82). Unfortunately, this idea reverses the order that the theories appear in Leibniz's writings, for the text containing the 'subjects theory' dates to April, while the text endorsing the 'pure relations theory' belongs to November.¹³⁷

Kulstad emphasizes the "On Forms, or, the Attributes of God," arguing that since thought and extension are forms, and all simple forms are attributes of God, Leibniz has inferred an extended God. This would put him far into the Spinozist camp. But the translation offered in Loemker differs dramatically: "Extension and thought are complex forms, for existence, duration, etc., are common to them" (L 160).¹³⁸ On this account, simple forms belong among God's attributes and complex forms like extension merely result from a combination of God's attributes. In 1682, Leibniz declares that the position in "On Forms, or, the Attributes of God" represents his only opinion on extension: "I have always held that neither thought nor extension are primitive or perfectly understood terms" (L 195 n6). However, Leibniz treats thought and extension as clear examples of simple, unanalyzable and indemonstrable attributes in "That a Most Perfect Being is Possible," an essay he wrote close to the end of 1676:

There are necessarily several affirmative primary attributes; for if there were only one, only one thing could be understood. It seems that negative affections can arise only from a plurality of affirmative attributes – for example, thought and extension. For as it is impossible for something extended to be thought without variety, it follows that certain modes of extension are necessary, and that all those which have been, are, or will be can be thought by one being. From this the origin and necessity of modification is evident. (DSR 93)

Platonists "there is *nothing* external to God, and moreover, the ontological dependency of creatures on God is theologically exactly right" (2001d: 453).

¹³⁷ Adams points out that the November dating is uncertain, but this again privileges a linear story of development.

¹³⁸ This differs only slightly from Parkinson's wording, "Extension and thought are certain more special forms" (DSR 69).

This essay contains a draft of an argument Leibniz showed to Spinoza when the two met at the end of 1676. It reveals Leibniz experimenting with Spinoza's monism, treating extension as an attribute of God containing modifications that necessarily result in a certain order.¹³⁹ In this experiment with Spinoza's monism Leibniz begins to assemble his relational theory of time, in which the divine attributes provide a foundation for real events. Earlier in the year, Leibniz defines simultaneous things as those things that require one another to exist. At the end of 1676, he explains that God thinks the necessary order of all non-simultaneous things, in the process becoming the sufficient reason for all things. Everything in the universe follows from combinations of his attributes according to certain rules. In 1679 Leibniz remarks that due to these considerations, "I found myself very close to the opinions of those who hold everything to be absolutely necessary" (L 263).

3. Motion and Transcreation

On the voyage that would take him to meet Spinoza, Leibniz writes the dialogue *Pacidius to Philalethes*,¹⁴⁰ where he presents a first philosophy of motion that involves synthesizing many of the positions he developed over the course of the year. Leibniz ponders the nature of change of place by interrogating three concepts of motion: discontinuous motion (or motion by leaps), continuous motion, and continuous motion with interspersed rests. Motion occurs by leaps when a moving body is transferred immediately from place α to place β , without passing through all the intermediary places α' , α'' , etc. This type of motion proves incoherent. Since scale makes no difference to the logical possibility of an

¹³⁹ This is even clearer in "Thought is not Motion" of December 76: "Extension is something that is most simple" (DSR 111).

¹⁴⁰ While this dialogue appears early in Leibniz's career, it is nevertheless highly significant. In "Russell's Conundrum," Arthur argues that Leibniz's late metaphysics grows out of a series of sustained studies of 1676; in particular, Leibniz's examinations of infinite division of matter, the infinite convergent series, and the nature of motion play a crucial role in the development of his system. Arthur argues that the *Pacidius* presents Leibniz's final position on the infinite division of matter, and includes hints of the ultimate metaphysics of infinite simple substances, the monads. In "Leibniz on the Mathematics of the Actually Infinite Division of Matter," Levey extends Arthur's analysis, arguing that Leibniz's position on "the central questions of metaphysics" at the beginning of the year has undergone drastic modifications by the end of the year, "and in each case, the change of mind is evident by November 1676, when he completes his

event, it is no different for a body to be teleported across a tiny interval than for us to suddenly find ourselves in Rome, attending John Paul II's funeral. Such motion defies all our experience, and introduces more confusion than it dispels. So without further ado, Leibniz dismisses motion by leaps, and turns his attention to continuous motion. Continuous motion requires a state of change, that is, an intermediary place α' between any two places α and β , where the body simultaneously occupies (at least part of) both places. However, this means that the state of change entails that two contradictory states of affairs obtain at the same time. Replace α' with 'dying,' α with 'alive' and β with 'dead' in the above sentence; clearly "if there was a moment in common to the living and the nonliving, then the same person would be simultaneously living and not living, which I acknowledge to be absurd" (LoC 147). Hence, the state of change is nonsensical and continuous change impossible.

Finally, Leibniz explores the possibility of motions interrupted by rests. Unfortunately, this hypothesis is not a serious alternative to the other two options, for the motion between rests must be either discontinuous or continuous, and both of these have proven indefensible. Leibniz's analysis leads us to an impasse, for we have lost both leaps and continuous motion. He overcomes this difficulty by appealing to durationless time and extensionless place; that is, rather than conceiving of these measures as units however small, he defines them as pure boundaries or limits, like the endpoint of a line. This allows him to introduce a different concept of leap, one Levey calls 'locus proximus': the transfer of a body from one point to another, where those points are at no distance from one another. The body does not leap over any intervening space because the boundaries of the two spaces touch one another; hence local motion occurs by infinitesimal 'leaps' from one contiguous space to another. Change, then, is an aggregate of two distinct states with no distance between them.¹⁴¹ These pseudo-leaps, however,

Pacidius to Philalethi. In these early writings on the continuum, the later metaphysics not only finds its seeds, but has positively taken root" (1998: 68).

¹⁴¹ Leibniz follows Aristotle's definition of the continuous as that which shares a common limit, and the contiguous as that which has its limits touching another's limits. Thus Leibniz affirms contiguous rather than continuous change: while the boundaries between two states are at no distance, there are still two limits, not one.

imply that a moving body has no continuous existence, and so we must appeal to something else to sustain the existence of phenomenal things:

I do not think we can explain this better than by saying that the body *E* is somehow extinguished and annihilated at *B*, and is actually created anew and resuscitated at *D*, which you may call by the new but very beautiful name *transcreation*. Moreover, although there is indeed a sort of a leap from one sphere *B* into the other *D*, it is not the kind of leap that we refuted above, since the two spheres are not distant... But no cause can be conceived for why a thing that has ceased to exist in one state should begin to exist in another... except a kind of permanent substance that has both destroyed the first state and produced the new one, since the succeeding state does not necessarily follow from the proceeding one. (LoC 213-215)

Leibniz defines this permanent substance as “a superior cause which by acting does not change” (LoC 213). He often uses arguments like the one here to prove that all matter is informed with minds.¹⁴² Indeed, Arthur points out that Leibniz’s original conclusion affirmed a plurality of substances,¹⁴³ “an indication that if each body had some principle of action in it, this would also be sufficient for the unity and temporal continuity of substance” (1989: 189). This passage suggests that the conception of monads is not far from Leibniz’s mind, even as he goes on to affirm that transcreation is the work of God.¹⁴⁴

However, given that the *Pacidius* provides arguments for multiple substances, it is all the more striking that Leibniz opted to return to the

¹⁴² For example, see the “Notes on Science and Metaphysics.”

¹⁴³ “it follows that proper and momentaneous actions belong to *those things* which by acting do not change” (LoC 211 emphasis Arthur’s).

¹⁴⁴ Since both leaps and continuous motion are impossible, leaps occur only when two places are at no distance whatsoever. However, the actual infinite division of matter entails the infinite division of motion as well: “the motion of a moving thing is actually divided into an infinity of other motions, each different from the other, and ... it does not persist the same and uniform for any stretch of time” (LoC 207). Already in “Infinite Number,” Leibniz has appealed to this infinite division to explain the formation of figures approaching circles. Every motion is divided into further motions, just as every body divides into smaller bodies, but there is no last one – no indivisible point is ever reached. Samuel Levey, in his “The Interval of Motion in Leibniz’s *Pacidius Philalethi*,” calls change the “punctual actions of substances” (2003b: 34) and describes the doctrine through a beautiful analogy with modern fractal analysis. Levey points out some of the potential consequences of Leibniz’s account of motion: “Leibniz already commits himself to certain kinds of claims about the topological structure of reality. Space and time are not going to be everywhere continuous in the mathematical sense that requires that any two points whatsoever will be separated by a further point lying between them. At least two points in space are going to be assigned that lie perfectly side by side... indeed every single occurrence of change or contact should give rise to such pairs of neighboring times of places...” (2003b: 5).

occasionalist account of the letter to Thomasius. Leibniz almost always defends a plurality of minds in every portion of matter, and yet here mind plays a decidedly reduced role. Arthur suggests that this is a rhetorical device: “If, as seems likely, he composed it with a view to drawing Spinoza into a discussion, it would have been good policy to try to gain the latter’s agreement on the lack of continuity of phenomena before becoming embroiled in a controversy over the nature of substance” (1989: 189). While this may be the case, we have seen that Leibniz vacillated on the status of substance in papers written around this time. He composed this dialogue at the height of his interest in Spinoza. Whether Leibniz adopted monism himself (as the November essay suggests) or for rhetorical purposes (as the majority of his work would suggest), he certainly treated it like a serious alternative, one worthy of careful consideration.

If, as Mercer and Sleight contend, Leibniz permanently adopted the production rule in April 1676, it seems quite odd that he did not utilize it in a dialogue devoted to a first philosophy of motion, especially since the production rule prevents the very occasionalism Leibniz endorsed in the *Pacidius*.¹⁴⁵ In a footnote to the *Pacidius*, Leibniz remarks that he will ignore the subject of motion until a later date. He had already spilled considerable ink over it. In the “Notes on Science and Metaphysics,” Leibniz considers the fact that a mind is uniquely united with its body, and does not have the same relationship with every body in the universe. This cannot result from the fact that bodies are isolated from one another, because we find that touching other individuals does not automatically unite our minds with theirs. He suggests that new minds replace the old, which cease to exist the moment they contact another portion of matter. But this would make minds momentaneous (as they are in the *Theory of Abstract Motion*), and contradict both our experience and our definition of mind as reflective. Leibniz concludes the paper without solving the problem; instead, he restates the hypothesis, positing a mind in every portion of matter. He explains that the

¹⁴⁵ Leibniz announces something closely resembling the version of transcreation given in the *Pacidius* when he writes his letter to Thomasius in 1671: “I have demonstrated, instead, that whatever moves is continuously created and that bodies are something at any instant in assignable motion, but that they are nothing at any time midway between the instants in motion” (L102).

“lawlike manner” of a mind’s perceptions adapts the motions of the body to the motions of other bodies in the universe. Leibniz’s position here resembles the cancelled passages in the *Pacidius*.

Leibniz qualifies the scope of mind in “On Motion and Matter,” a very tentative piece he wrote immediately before “Infinite Number.” He argues that although motion requires mind, individual minds are not sufficiently powerful to coordinate all the motions in the universe; instead, he claims that “the universal mind” recreates every body at every instant, and therefore that “God is the immediate cause of all things” (LoC 81). He corroborates this conclusion by mentioning situations in which the conservation of quantity of motion does not apply, implying that only God’s mind can sufficiently coordinate bodies so as to ensure the conservation of relative motion. Leibniz recognizes a conflict between this conclusion and his rejection of a vacuum, pointing out that many of his arguments against the vacuum assume that motion is intrinsically directional and thus that place is independent of bodies. While neither of these assumptions fit well with the position he has slowly developed over the course of the year, he leaves the difficulties unanswered in this set of notes. Instead, he alludes to Spinoza’s argument against Zeno’s wheel¹⁴⁶ and experiments with the consequences of discontinuous motion. He adds a separate note at the end of the essay, arguing that discontinuous motion implies the infinite actual division of bodies, a situation that ruptures the unity of every individual body.

He examined the problem in “Infinite Number,” where he explains how reality can perfectly imitate continuity if a certain rule persists throughout all changes. Instead of the same matter remaining after a change, “It can be mind itself, understood as a certain relation: for instance, in *transproduction*, even though everything is new, still, by the very fact that transproduction happens by a certain law, continuous motion is imitated in a way, just as polygons imitate the circle. And hence one may be said to come out of the other, by a similar abuse, as it were, of the imagination” (LoC 99). This comment is interesting for several

¹⁴⁶ “One proves that there is one motion faster than another by the motion of a radius about some center, in which radius various points are designated” (LoC 81).

reasons. First, it shows that Leibniz's pluralism has the resources to handle transcreation.¹⁴⁷ Second, it more explicitly states the law of the series hinted at in Leibniz's other April papers, and ties the production rule directly to Leibniz's work in the mathematics of infinite series.¹⁴⁸ Third, it reveals a discontinuity in the development of Leibniz's concept of substance: instead of a steady progression towards the monad, we find Leibniz digressing into experiments with monism.

Leibniz returned to these problems shortly after writing the *Pacidius*. He seems much more certain of his understanding of the motion of bodies, concluding that "Space and Motion Are Really Relations" in early 1677. His arguments resemble those of "On Motion and Matter," except that his recent dialogue allows him to avoid tentative statements of his position. He argues that we can determine the absolute subject of motion only so long as we believe in absolute motion, something that follows if we posit space as "a certain thing consisting in a supposed pure extension" (LoC 225). The conception of immensity Leibniz elaborated early in 1676 eliminates the need to define space as an entity; instead, space consists in the relations between things. He considers movement to be a change in the relations between bodies. Any body can be treated as if it were in motion, so long as one consistently measures the motion of other bodies from the same frame of reference. One unchanging coordinate system suffices to determine the motion of every body in the universe, and so one has no need to appeal to absolute space. He illustrates his conception with a comparison of one movement observed from a ship in a current and the same movement observed from on shore. He argues that we can measure a motion perfectly accurately from any frame of reference, so any body can be considered either at rest or in motion. In other words, without absolute space no individual

¹⁴⁷ Actually, Leibniz is somewhat ambiguous on this point. While the "Notes on Science and Metaphysics" assert a plurality of minds, the following essays often leave the number of minds unstated. He often writes of mind singular, leaving out reference to a plurality of minds. I suggest we recognize the similarity between this uncertainty and the changing role of subjects in his examination of relations: Leibniz accepts substance pluralism some of the time, but becomes increasingly uncertain as the year progresses.

¹⁴⁸ In his "Metaphysics, the Late Period" Rutherford emphasizes the connection between the law of the series and Leibniz's mathematics.

can properly be called the subject of motion. Leibniz's argument follows the same format as the numerical and town analogies: from the perspective of any one property, number, or body all the others can be arranged to consistently express the same essence, sum, or universe.

Leibniz's inference has startling consequences. His mechanist convictions compel him to treat every physical action as an instance of local motion. On this account, the body α acts on body β when α transmits some portion of its motion to β . The discovery that no body moves absolutely entails that no body acts absolutely, for we can find a consistent frame of reference in which β transmits some of its motion to a stationary α . Imagine a situation in which I fire a gun at my enemy. The bullet flies out of the gun and strikes him in the chest, knocking him to the ground. One wants to be able to say that the bullet acts on my victim, causing the injury he sustains; however, in some frame of reference, the bullet remains absolutely still. My enemy foolishly rushes towards the obstacle I place in his path, impaling himself on it. Although the first description involves fewer moving bodies, the second explicates the situation just as accurately. In it, my victim acts on the bullet.

Since there is no absolute space, no absolute position exists in the universe. Without absolute place, all motion is relative. Imagine a situation in which three bodies α , β and γ are at equal distances from one another at t_1 but at t_2 γ is further away from both α and β . It is equally true to say that α and β move away from the stationary γ as it is to say that γ moved away from a stationary α and a stationary β . Since motion occurs despite the fact that no individual moves *per se*, only the whole universe can be said to move absolutely, and so the only mind that can coordinate this motion is the mind of the whole universe: "if motion is an affection, its subject will be not one individual body, but the whole world" (LoC 229). Arthur explains that 'affection' in this context means 'disposition.' When Leibniz asserts that only the whole world meets the requirements of the subject of motion, he means that we have no reason to treat motion as the disposition of a single body, for under the relativity of motion the disposition belongs equally well to any particular body. As Leibniz explains at the end of

“On Motion and Matter,” relations can describe every possible situation; the real world, however, consists only in a determinate set of relations. This idea further separates ideal entities like space and time (which consist only in relations abstracted from the world) from actual things which provide a real foundation for a specific set of relations. Leibniz’s point here resembles the one he makes in the “Notes on Science and Metaphysics”: we can consider universal space a real thing when it is founded in God’s immensity and describes actual relations among bodies, but when we consider it in the abstract, as if space were a thing in the absence of actual bodies, we confuse the real with the ideal.

Leibniz does admit a difference between the formal cause of motion and the actual cause of motion. He distinguishes between the whole universe considered as the form of motion and the individual body responsible for a change in the speed and direction of another body. Leibniz claims that an infinite regress explains nothing in the current situation, so appealing to the whole universe as the cause of a given change in a body leaves the question unanswered. Leibniz implicates an argument he makes in his notes on Spinoza’s letter to Meyer: if one imagines an infinite causal sequence, one can subtract an infinite number of causes from the chain without eliminating the sufficient reason for an event. On this account, however, we can identify the agent and the patient only by appealing to conventions. Further, change in the speed and direction of the motion of β amounts to the annihilation of β , since speed and direction are β ’s only individuating marks. Transcreation remains Leibniz’s solution to the problems of a philosophy of motion.

The more substantial position Leibniz offers in 1677 results when he combines the analysis of motion offered in the *Pacidius* with the accumulation of arguments related to the numerical and city analogies. Local motion is only possible on the basis of something (or things) which in acting does not change. Substance is the name for that which always acts. However, the relativity of motion ensures that the activity of each substance must produce the whole universe. Thus, only the whole universe really amounts to a substance, and every body can be seen as a modification of the universe. Obviously, such a view

conflicts with Leibniz's mature metaphysics. It further undercuts the argument that Leibniz has adopted the law of the series as a necessary component of every individual in the universe. For at least a short time, Leibniz doubted that there were any individuals other than God. We can see how the rehabilitation of substantial forms will extricate Leibniz from the universe he currently envisions, but we also see that he has not developed that solution yet.

While we may be tempted to treat Leibniz's revelations regarding the subject of motion as unrelated to his work on Spinoza, his later reactions confirm our suspicion. The notion of a universal intellect coordinating all the motions in the universe helped Leibniz escape his recurring problem with Descartes' laws of motion.¹⁴⁹ Although a detailed discussion of Leibniz's introduction of substantial forms would take us away from the principal discussion in this paper, this development also owes some of its impetus to Spinoza. The day after one of his meetings with Spinoza, Leibniz recognizes that Spinoza's ontology cannot support orthodox Christianity, for it renders God incapable of making decisions. Leibniz recoils from Spinoza's monism as soon as he realizes its consequences: Everything that can exist, does exist, independently of what God 'wants'. He writes, "If all possibles existed, no reason for existing would be needed, and possibility alone would suffice. Therefore there would be no God except insofar as he is possible. But such a God as the pious hold to would not be possible if the opinion of those is true who believe that all possibles exist" (L 169).¹⁵⁰ As Leibniz realizes the extent of Spinoza's heresy, he also realizes that Spinoza has better explained some of the consequences of Descartes' principles than Descartes himself had done. In a letter to Christian Philipp, he admits that Spinoza's determinism more adequately explains Descartes' principle that "matter takes on, successively, all the forms of which it is capable" (L 273).¹⁵¹ According to Leibniz, both Descartes' and the Occasionalists' responses to the mind-body

¹⁴⁹ See, for example, his "Notes on Descartes' *Principles of Philosophy*."

¹⁵⁰ Leibniz accepted this idea when he wrote the "Notes on Science and Metaphysics" in March of 1676: "Now I see that there is no number or multiplicity of nonexistent possibles, that is, things which neither are, nor were, nor will be, because by their very position, that is, accidentally, they are impossible" (LoC 53).

problem imply a universe in which every individual is a modification of the one substance, a being that acts according to complete necessity.

Later in life, Leibniz always criticizes the Occasionalist treatment of motion for implying a Spinozistic God. For example, in 1698 Leibniz writes “Nature Itself,” a longish essay in which he attacks the Cartesian foundations of the Occasionalist philosophy by contending that the law of conservation of quantity of motion has to be replaced with a law of conservation of force. Leibniz explains that every substance must act, and act over a sustained period. Without this activity uniting diverse states in one substance, diverse states would be better described as diverse modes of something that does act. The Occasionalist, in holding that only God acts, thereby denies the coherence of any body. Only the whole universe can be called one body, and so in their account, “everything would reduce to just transitory, evanescent modifications or phantasms, so to speak, of one permanent divine substance” (WF 214). In other words, Occasionalism leads to Spinozism, “a doctrine of very ill repute which an irreligious, though admittedly clever, author has recently introduced to the world” (WF 214). In analyzing the consequences of Spinoza’s system, Leibniz discovers several reasons to change his conception of the world.

In fact, one could argue that Leibniz discovers both problems and solutions in Spinoza’s work. For example, the description of relations between divine attributes in TMGU sounds a great deal like the explanation Leibniz gives of the formation of the soul in 1681’s “The Origin of Souls and Minds.” He explains that when God treats one fragment of the universe as if it were at absolute rest with respect to everything else, there arise souls: “Insofar as God relates the universe to some particular body, and regards the whole of it as if from this body or, what is the same thing, thinks all the appearances or relations of things to this body considered as immobile, there results from this the substantial form or soul of this body” (LoC 261). God’s thought contains the whole history of that fragment; should he also give the mode self-consciousness it will produce

¹⁵¹ This realization likely affected the new doctrine of contingent truths he offers in “On Freedom.”

(or reproduce) the whole sequence of its history in its body and its perceptions. This text belongs among the cluster of notes in which Leibniz begins reintroducing substantial form. Leibniz responds to occasionalism by reproducing the universal law of the series within every individual substance. By introducing a law of the series into every distinct perspective on the universe, he discovers a locus in which to locate the conservation of *vis viva* or force. The law of the series is a principal of action specific to the individual that obeys it: on the occurrence of one perception, it generates the correct subsequent perception. In this way, numerous points of view of the universe come together to form one self-identical unit. Hence his reintroduction of substantial form implicates Spinoza twice: first, because consideration of Spinoza's philosophy helped Leibniz to invent this solution; second, because solving the problem also attacks the grounds for Spinoza's 'atheism.'

IV. Conclusion

Mercer declares that the only thing that she will consider a refutation of her argument is an interpretation as comprehensive as hers, one that can find a consistent metaphysical framework in an enormous number of texts. She believes that we will only understand Leibniz's metaphysics if we recognize him steadily developing the implications of the set of Aristotelian and Platonist assumptions that purportedly sustained his inquiry from the days he finished university. The problem with Mercer's method is that no textual base will ever be broad enough to prove her point. She would have to show that nowhere in the 150, 000 pages Leibniz wrote does he deviate from the set of assumptions she attributes to him. In this essay, I have neither taken as broad of a textual basis as Mercer, nor have I located fixed assumptions behind Leibniz's thinking. Instead, I have shown that Leibniz broke with some of the assumptions she attributes to him. His attempts to solve the continuum problem in 1676 notes reveal a man constantly wrestling with new ideas, actively experimenting with as many different systems as he came across. Leibniz changed his mind frequently; his flirtations with other perspectives provided him with many valuable concepts he would use to construct his mature metaphysics. Insisting that his development followed a linear path

constrained by his core assumptions betrays the very eclecticism Mercer considers Leibniz's defining feature.

I propose we diversify Mercer's monolithic development story with a criterion of influence that better represents Leibniz's diverse interests. It is widely recognized that Leibniz's first solution to the problem of cohesion was profoundly influenced by his study of Hobbes. In 1671, Leibniz wrote the *Theory of Abstract Motion* in which he introduces the notion of endeavour as 'the beginnings of motion.' He argues that when the beginnings of motion in one particle happen to involve motion into space occupied by another, then this beginning of motion entails the beginning of penetration of the one particle by the other. Two particles beginning to penetrate one another become a single coherent item – and thus a single body can be formed in a world where everything is infinitely divided.

In his "Conatus, Hobbes, and the Young Leibniz," Howard Bernstein examines the evidence for Hobbes' influence. He points out that Leibniz begins to utilize endeavour after he closely examined Hobbes' works, and his version resembles Hobbes' in essential respects. Leibniz's early notes not only repeat Hobbes' definition of endeavour word for word, but they also contain diverse paraphrases and slight modifications of the same concept. Both consider endeavours to be infinitesimal actual motions that can be compared with one another. Both consider endeavour a dynamic concept and use it to explain elasticity in bodies. Leibniz even wrote a letter to Hobbes praising his work exorbitantly. Although Leibniz amended and transformed Hobbes' concept even in his earliest work (for example, Hobbes defines a point as a tiny extended something whose size we ignore, while Leibniz holds that a point is a boundary, not a part), Bernstein contends that conatus "affected an unbroken transition into Leibniz's mature metaphysics as dead force [*vis matua*], expressed in the language of his calculus as an infinitesimal difference of velocity with respect to

time” (1980: 36).¹⁵² Bernstein’s analysis provides us with a set of criteria that should be met before we assert that one philosopher influenced another:

- (1) Similar or identical ideas must appear in the writings of the two figures. I call this ‘similarity.’
- (2) Obviously, if we hope to show that one thinker influenced another, we should show that the idea appears first in one thinker, then, after the second thinker discovers the relevant belief of his predecessor, the second thinker should begin to utilize the same idea. I call this ‘chronology.’
- (3) The idea should cohere with the rest of the thinker’s system, or changes in the larger system to make said coherence possible should appear. I call this ‘adaptation.’
- (4) One should show that no other thinker influenced our subject in a similar way, or that such influence occurred well after the thinker was exposed to the alleged originator. I call this ‘exclusivity.’
- (5) It helps when a thinker admits an influence, or praises another thinker for an idea they share. I call this ‘avowal.’

In the previous chapters we have explored the constant overlap between Leibniz’s 1676 work on the continuum and his study of Spinoza. Spinozistic language and concepts repeatedly appear as Leibniz attempts to solve the paradoxes of the continuum. In particular, we have seen that Leibniz’s examination of the concepts that became his relational account of time draw heavily on his interaction with Spinoza’s ideas. In February, Leibniz introduced multiple levels of infinity to explain the nature of God’s immensity and eternity. These are not only (1) similar to Spinoza’s concepts, but also (2) chronological, for he wrote his notes on Spinoza’s *Ethics* before he tested the ideas out on his own. Further, we have reason to suspect that Tschirnhaus introduced him to these concepts even earlier, though perhaps without acknowledging their source. Leibniz slowly (3) adapted his definition of eternity until it closely resembles

¹⁵² See Arthur’s insightful account of Hobbes’ influence in his “Introduction.” Arthur points out that Leibniz reverses Hobbes’ reductionist interpretation of endeavour. Rather than showing that minds are unnecessary, Leibniz contends that “all mechanical explanations are insufficient that are not ultimately founded on the mentalistic notion of endeavour” (LoC xxxi).

Spinoza's own, and this adaptation figures in other modifications he makes to his philosophy. The new definitions of immensity and eternity become a permanent part of Leibniz's relational theory of time and space. Leibniz argues that the divine attributes make temporal and spatial reality possible. While (4) is problematic, especially in the case of immensity, we have seen that Spinoza's work also reminded Leibniz of many related philosophers. Given the strength of (2), it seems plausible that Spinoza introduced Leibniz to the importance of immensity.

Leibniz's examination of the law of the series less perfectly meets our criteria. The analogies he explores do not appear in Spinoza, and they do appear very early in Leibniz's philosophical career. However, Leibniz begins to examine the analogies in a new way in 1676. We have seen that these new studies attempt to answer a question (1) similar to the one Tschirnhaus posed to Spinoza (2) before he met Leibniz. Tschirnhaus asked how it was possible that infinite properties could follow from the definition of an attribute. Leibniz tested various (3) adaptations of his solutions, finally contending that infinite modes can result when one attribute is treated as the focal point of the relationships between all the other attributes. An account similar to this one ultimately explains the place of the monads in Leibniz's system. Importantly, Leibniz's affirmation of a single substance containing an infinite number of creatures that differ only modally from one another meets the first three criteria admirably, and Spinoza's notoriety ensures that (4) he was thinking of Spinoza when he came to this conclusion. Tschirnhaus offered this solution to Spinoza in the same words Leibniz chose to express it. While this (5) 'avowal' is rather limited, it certainly reveals the connection between Leibniz's solution and Tschirnhaus' problem.

Finally, when Leibniz wrote the *Pacidius to Philalthes*, a work which contains many of his lasting solutions to the labyrinth of the continuum, he ends with an affirmation very much like the Spinozistic universe he deduces in "That a Most Perfect Being is Possible." When Leibniz rejected the occasionalism of the *Pacidius*, he began pointing out (1) similarities between occasionalism and Spinozism. These similarities only became evident to him (2) after he had

experimented with Spinozistic substance monism. Leibniz begins to reintroduce substantial forms, (3) adapting his system to avoid the unwelcome consequences he had discovered in Spinoza's deity. While heretical views were no rarer in the seventeenth century than they are today, Leibniz frequently (5) avows the danger and disgust he feels when he encounters Spinoza's philosophy or systems that collapse into it. Although numerous factors conspired in Leibniz's decision to reintroduce substantial forms, we have seen that not least among these is Leibniz's careful examination of Spinoza's philosophy.

There is no denying Spinoza's influence on Leibniz's 1676 works on the continuum problem. Leibniz engaged in a sustained study of Spinoza's philosophy, going so far as to try out, however briefly, Spinoza's monism. Many commentators balk at this claim, but in the *New Essays on Human Understanding*, Leibniz (5) admits a youthful attraction to Spinoza's theory: "You know that I once strayed a little too far in another direction, and began to incline to the Spinozist view which allows God infinite power only, not granting him either perfection or wisdom, and which dismisses the search for final causes and explains everything through brute necessity" (NEHU 73). At no point have we encountered anything suggesting such a complete acceptance of Spinozism in Leibniz's early works. We have seen the beginnings of monism in a few of his essays, but even in "Secrets of the Sublime," where God temporarily becomes the world soul, Leibniz still insists that God is a person.

However, it is highly unlikely that Leibniz's tenure as a Spinozist came after the Paris period, for in 1678, when Schuller rushed him a copy of the newly published *Opera Posthuma*, he displays nothing but impatience with Spinoza's thinking.¹⁵³ He writes detailed notes on the first two books of the *Ethics* and, while he endorses both Spinoza's definitions of eternity and freedom, his subsequent remarks display increasing disgust with Spinoza's work. Early comments like "thus our author" (L 200) give way to "All the rest is introduced as an empty pretentious device to twist the whole into the form of a demonstration.

¹⁵³ This is fitting with recent disavowal, for ideas we have recently rejected get worse treatment than those that do not threaten or embarrass us in that way – the positive remarks he makes in NEHU show maturity and distance, not the heat of the moment.

Reasoning of this kind is very common among men who do not know the true art of demonstration” (L 202). He finds Spinoza’s arguments extremely unsatisfactory, exclaiming that they do damage to our reason: “Our author’s mind seems to have been most torturous; he rarely proceeds by a clear and natural route but always advances in disconnected and circuitous steps, and most of his demonstrations surprise the mind instead of enlightening it” (L 204). Ultimately, Leibniz objects to Spinoza’s foundational belief in the identity of God and nature, and so he attacks every argument that leads to a conclusion he equates with atheism.

But even in 1678, Leibniz does not consistently treat Spinoza with contempt. In a letter to Henry Justel of February 1678, Leibniz writes, “The posthumous works of the late Mr. Spinoza have at last been published...I have found there a number of excellent thoughts which agree with my own...But there are also paradoxes which I do not find true or even believable.” Leibniz finds Spinoza’s heretical positions too disconcerting to believe, concluding, “I consider this book dangerous for those who wish to take the pains to master it. For the rest will not make the effort to understand it” (L 195n6). We have seen that after Tschirnhaus exposed Leibniz to Spinoza’s philosophy, the two frequently discussed Spinoza’s work. Leibniz invested time and energy into exploring the consequences of Spinoza’s doctrines. Indeed, Tschirnhaus’ letters to Spinoza contained insights and criticisms derived from Leibniz’s efforts. For at least a short time, the two collaborated in a critical study of Spinoza’s works, with the intention of mastering it. When he received the *Ethics*, Leibniz devoted the same effort to the text before he passed judgment on it. By his own admission, accurately evaluating it required mastering it. Once he understood the work, however, he quickly disavowed it, seeing the danger it posed to several of his basic beliefs. He then devoted his attention to disabusing Tschirnhaus of his Spinozist convictions. He reports success in June 1682, but the title and contents of Tschirnhaus’ book suggest otherwise.¹⁵⁴ Leibniz may never have known the extent of Tschirnhaus’ Spinozism. Ideas like divine immensity and the threefold

¹⁵⁴ See his *Medicina Mentis et Corporis*.

infinite may have emerged in his discussions with Tschirnhaus while the latter was still under a ban of silence. Nevertheless, Leibniz adopts the concepts for his own use and applauds them when he encounters them in Spinoza's work.

The one criterion that remains questionable throughout our study is (4) exclusivity. However, it is just this exclusivity that I called into question at the beginning of my study. Overemphasizing exclusive influences tends to obliterate the nuance necessary for understanding the philosopher under examination. Rather than trying to reduce Leibniz to Spinoza or show the irreconcilable differences between the two, I have examined the issue from a different angle. For the purposes of my study, it hardly matters whether or not Leibniz ever adopted Spinoza's position. What matters is the fact that he examined it in detail, using it to sharpen his own conception of the universe. Leibniz was a man familiar with nuance. A lawyer, a bureaucrat, a historian, a theologian, a mathematician, a philosopher – everywhere he worked to bring about a grand reconciliation of moderns and scholastics, of Protestants and Catholics. He sought the harmony within many apparently incompatible methods and principles, eventually producing the complex metaphysic hinted at in the *Monadology*, a metaphysic founded on a detailed analysis of almost every field of inquiry.

By claiming that one philosopher influenced another, I do not mean that the one becomes a disciple who adopted all (or even most) of the other's key positions. On my account, an influence is more like a fellow traveler, someone exploring problems similar to our own in a way that excites and entices us to think differently. Even though we may find that our fellow travelers' views are desperately flawed, nevertheless we can find concepts and arguments we can borrow and employ in response to our own problems. We piece together a philosophical assemblage in response to the entire complex environment around us, including the theories of our friends and foes. Leibniz perfected this technique, accomplishing in advance something akin to the Arcades project that Walter Benjamin barely even began. He corresponded with thousands of his contemporaries, absorbing everything that he could from the world around him. By examining the details of Leibniz's interaction with Spinoza's philosophy, we

learn a great deal about the two subjects of our study, but more importantly, we receive an excellent lesson in philosophical borrowing.

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