KANT'S SUBSTANCE, ETHER, AND MOVING FORCES OF MATTER

by
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ABSTRACT

I will examine Kant's argument that, as a necessary condition of possible experience of the constantly changing physical world, there must be something which is always in existence of which all substances and changes are merely determinations. I will first examine Kant's writings on substance in the first analogy of experience from the *Critique of Pure Reason*. I will then examine interaction in the third analogy, the *Metaphysical Foundations of Natural Science*, and *Physical Geography*. Then, I will examine Kant's conception of ether in *Opus Postumum*, showing that it should be understood as the always persisting material that Kant has in mind when he writes about substance and interaction. Expanding on his conceptions of substance and community in the *Critique of Pure Reason*, I will argue that Kant's ether proofs are a necessary addition to his Analogies of Experience in the *Critique of Pure Reason*.

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ABBREVIATIONS

Critique of Pure Reason	*CPR*
Metaphysical Foundations of Natural Science	*MFNS*
Physical Geography	*PG*
Opus Postumum	*OP*

INTRODUCTION

Immanuel Kant describes experience as "the sum total of all appearances" (*CPR* B163). Explaining that the stage for all our experiences is the world, Kant claims that the first part of knowledge of the world is the physical description of the Earth.[1] Experience, to Kant, is characterized by its unity, wholeness, or systematicity, and Kant explains that there can only be one experience. When we speak of more than one experience, we mean *perceptions* within one experience. To Kant, experience is among the "branches of knowledge that produce an understanding of connections" (*PG* 9:158).

Kant explains in *Physical Geography* that someone who has travelled widely has seen the world, but that the person's knowledge of the world requires more than perceptions of parts of the Earth.[2] He argues that knowledge originates with the senses and reason gives a form to the material given to us by our senses, meaning that knowledge of the world can be produced despite the limitation of humans being unable to have a perception of the geographical system as a whole.[3]

To Kant, experience is knowledge which is attained through the unity and connection of perceptions. In his view, "in the strictest sense, there are no **experiences**, only **perceptions**, which, taken together, constitute **experience**" (*PG* 9:157). To Kant, our knowledge is a system, not an aggregate and "we need to become acquainted with the objects of our experience as a whole" (*PG* 9:158). The unity of apperception is not a

[1] See Immanuel Kant, *Physical Geography*, in *Natural Science*, ed. Eric Watkins (New York, Cambridge University Press, 2012). 9:157.
[2] See *PG* 9:157.
[3] See *PG* 9:159.

necessary condition for individual perceptions to occur, but our experience of succession, simultaneity, and any changes in objects relies on the unity of apperception.

In the first analogy of the *Critique of Pure Reason*, Kant examines our experience of alteration in the constantly changing world of appearances. Explaining that something permanent must underlie the continuous change of the empirical world, Kant attempts to demonstrate the necessity of some thing or things which are absolutely persistent, sempiternal, and omnipresent. Without some persisting thing, everything would be in constant flux and we could not be aware of succession or simultaneity. We "would have to start entirely over with every new object without the previous one being in the least connected or being able to stand in a temporal relation with it" (*CPR* A214/B261). In the first analogy, Kant explains that we cannot perceive something coming to exist or ceasing to exist absolutely. When something seems to have come or ceased to exist, one is perceiving a determination of something which persists. Kant proposes the idea of substance as that which underlies the constant changes.

However, it is unclear what Kant means when he uses the word substance. Sometimes it seems like many substances could endure relatively, while at other times it seems as though one absolutely permanent universal substance underlying all changes is required. Bryan Hall notices a dilemma that arises from opposing conceptions of substance: if substance merely refers to an omnipresent and sempiternal substance, ordinary objects and their alterations could not be individuated. However, if the category of substance applies merely to ordinary empirical objects, then, as Hall writes, "although one could individuate these substances and experience their alterations, the category

would not pick out a common spatiotemporal framework for these experiences."[4] It is unclear in the first analogy whether the category of substance always refers to an omnipresent and sempiternal substance, or whether the category of substance can also apply to ordinary, relatively persisting, empirical objects. In my examination of the first analogy, I will distinguish between two different understandings of substance and will show in chapter one that Kant is able to simultaneously argue for the existence of both types of substance.

In chapter two, I will move on to the second and third analogies of experience, which focus on succession and simultaneity. In second analogy, Kant argues that causality plays a crucial role in our experience of succession. In his discussion of cause and effect in the second analogy, he includes an example of a cause being simultaneous with an effect. The third analogy expands on the idea of simultaneous causality and Kant proposes the idea that all simultaneous objects are in relations of mutual interaction, each causing determinations in all others. Since simultaneity seems to be covered in the second analogy, many Kant scholars have dismissed the third analogy as redundant. However, I will argue that, while the third analogy's discussion of mutual interaction is related to the second analogy's discussion of cause and effect, it is wrong to assume that Kant's third analogy is a negligible part of the *Critique of Pure Reason*.

In the third analogy, Kant describes a situation of thoroughgoing interaction throughout the entire cosmos. Kant argues that we can only determine the existence of

[4] Bryan Hall, "A Dilemma for Kant's Theory of Substance," *British Journal for the History of Philosophy* 19, no. 1 (2011): 79.

physical objects in different positions of empirically perceived space if we can posit dynamical interactions between physical objects. Although he insists that he is not refuting empty space, Kant explains that empty space is not a perceivable object and is, therefore, "hardly an object for our possible experience" (*CPR* A214/B261). Therefore, Kant argues that perceptions of appearances in space must not be broken off and must be in relations of reciprocal community.

However, examining the interaction between distant objects such as the Earth and the other heavenly bodies, Kant is unclear about what it means for all substances to be in community. He remarks that community could be either immediate or mediate. To distinguish between the two types of interaction, I will look to Watkins' distinction between weak and strong thoroughgoing interaction. As I will show in my second chapter, a weak interpretation of thoroughgoing interaction could simply involve interaction or community mediated through our perception of simultaneous objects. A weak interpretation is consistent with the arguments of the analogies. However, as Kant hints in the *Critique of Pure Reason* and makes clear in other works, such as the *Metaphysical Foundations of Natural Science, Opus Postumum,* and the *Physical Geography*, I will argue that he himself prefers a stronger interpretation of thoroughgoing interaction involving the immediate attraction and repulsion of constantly moving forces of matter throughout all of space.

In my third chapter, I will examine Kant's ether deduction in *Opus Postumum*, which I believe sheds important light on Kant's arguments regarding substance and interaction in the first *Critique*. Kant's *Opus Postumum*, a collection of unfinished

manuscripts, has been a controversial addition to Kant's works. Some Kant scholars argue that it is too unorganized to be properly examined, while others go as far as to say that it is a product of senility at the end of Kant's life. I, however, agree with those who believe that we should take the *Opus Postumum* seriously. I will argue that it gives crucial insight into how the analogies of experience should be understood and how we can relate Kant's metaphysics to his scientific works.

Echoing his description of a universally penetrating substratum in the first analogy, Kant explains that the unity in our experience of a world of interacting objects can be accounted for by suggesting that there is an all-encompassing material field of activity which is necessary for the possibility of our perception of physical things. Kant describes a material field that is universally distributed and all-penetrating, within which all other moving forces, as well as light, are included. Matter, to Kant, is understood dynamically in terms of attractive and repulsive forces. Permanently moving by its own attraction and repulsion, the material field that Kant describes is the origin of the movement of all materials and their formation into regularly determined bodies. Kant calls this idea 'ether' or 'caloric,' describing it as a material which "lies at the basis of the possibility of the moving forces and their combination into one experience."[5] I will show that the idea of ether is crucial in Kant's arguments regarding the unification of the moving forces of matter.

A major shift can be seen in Kant's conception of perception between the *Critique of Pure Reason* and later works like the *Metaphysical Foundations of Natural Science*

[5] See *OP* 21:229.

and *Opus Postumum*. Kant's explanation of perception as appearance combined with consciousness in the *Critique of Pure Reason* is not the explanation of perception that he holds throughout his whole career. In later works, Kant makes it clear that in order for a body to be perceived in space, the body must affect one's senses by exercising some force upon one's senses. As Kant explains in the *Metaphysical Foundations of Natural Science* and expands upon in *Opus Postumum*, our perception and the unified experience of outer objects is made possible by the moving forces of matter, which must be distributed throughout all of space. As I will show in chapter three, ether, the object of an all-inclusive experience, contains all the sense-affecting and perception-effecting forces of matter. Arguing that the actuality of empty space is not an object of possible experience, Kant proposes the ether as the one object of our unified experience which makes physical space knowable.[6] To Kant, the unity in our experience of a world of interactive objects can be accounted for by suggesting that there is an all-encompassing material field of activity which is necessary for the possibility of our perception of physical things. Therefore, I will show that an examination of Kant's changing explanations of perception is crucial for an understanding of the analogies of experience and how they fit with later related works.

As a necessary condition of possible experience of the constantly changing physical world, Kant explains that there must be something which is always in existence of which all substances and changes are merely determinations. Expanding on his conceptions of substance and community in the *Critique of Pure Reason*, Kant's

conception of ether in *Opus Postumum* should be understood as the material which persists through all change and in which thoroughgoing interaction takes place. In chapters one and two, I will examine the analogies of experience from the *Critique of Pure Reason*, which focus on temporal experience, specifically duration, succession, and simultaneity. Then, building on the first two chapters, chapter three will highlight the importance of ether in the necessary conditions of possible experience. Then, I will argue that Kant's ether proofs are a necessary addition to his analogies of experience in the *Critique of Pure Reason*.

CHAPTER ONE

I. Introduction to Chapter One

Kant explains that things in time are always changing, but the constant flux occurs in a single time. Believing that nothing can arise from or perish into nothing, Kant suggests that something must underly the constantly changing things we perceive. As a necessary condition of possible experience of the constantly changing physical world, he explains that there must be something which is always in existence, allowing for one same temporal framework throughout all change. He attempts to demonstrate the necessity of a quantum that does not increase nor diminish of which the substances that we perceive are merely determinations. He proposes the idea of an absolute persistent, sempiternal, and omnipresent substrate underlying substances. As Gordon Nagel explains, although Kant does not preclude the possibility of new things, he does rule out the possibility of things that are new in respect of their substance.[7] However, it is sometimes unclear whether Kant's description of substance requires a sempiternal, omnipresent substrate, or whether relatively enduring substances are sufficient for our experience and temporal unity. Focusing on Kant's sometimes contradictory descriptions of 'substance,' I will use this chapter to explore the distinction between relatively enduring substances and an absolutely persisting Substance which endures throughout all changes.

[7] Gordon Nagel, *The Structure of Experience: Kant's system of Principles* (Chicago: University of Chicago Press, 1983), 149.

II. The Three Analogies of Experience

One of Kant's fundamental endeavors in the *Critique of Pure Reason* is to explain how experience is possible. Arguing that the possibility of *temporal* experience is what Kant has in mind, Watkins suggests that "Kant's general task transforms into the more specific task of explaining how the unity of time is possible."[8] Following Watkins' claims about the importance of considering the temporality of experience, I will focus on the analogies of experience, which are centrally concerned with issues of time-determination. As Watkins explains, the analogies of experience in the *Critique of Pure Reason* "are concerned with the possibility of experience in the form of the unity of time."[9] Guided by the claim that we cannot perceive time itself, the analogies concern necessary connections in perception. As a general principle of all the analogies, Kant states in the first edition that "as regards their existence, all appearances stand *a priori* under rules of the determination of their relation to each other in **one** time" (*CPR* A176). In the second edition, he updates the general principle, writing, "experience is possible only through the representation of a necessary connection of perceptions" (*CPR* B218).

Time itself cannot be perceived, so, argues Kant, "it is in the objects of perception, i.e., the appearances, that the substratum must be encountered that represents time in general and in which all change or simultaneity can be perceived in apprehension through the relation of the appearances to it" (*CPR* A182). However, the necessary connections of perceptions cannot become evident in the perceptions themselves. Instead,

[8] Watkins, *Metaphysics of Causality*, 193.
[9] Watkins, *Metaphysics of Causality*, 185-186.

the existence of objects in time is determined through *a priori* concepts through which the necessary connection of perceptions is represented in our experience.[10] Kant's goal of the analogies is to show that, in Lucy Allais's words, "we can know a priori that the spatial objects of our experience are in necessary causal connections with each other and that they are made up of stuff which exists before and after they exist (that substance is conserved)."[11]

A priori pure concepts of the understanding, the concepts of the analogies produce cognitions when combined with sensible intuitions.[12] Through the modi of time corresponding to the three analogies, the subject imposes transcendental temporal structures on sensory objects given in experience. The three analogies are concerned with three different conditions of time-determination: "persistence, succession, and coexistence" (*CPR* A177/B219). Principles of the determination of the existence of appearances in time, the three analogies relate to the three modi of time: "that of the relation to time itself, as a magnitude (the magnitude of existence, i.e., duration); that of the relation in time, as a series (one after another); and finally that in time as a sum of all existence (simultaneous)" (*CPR* A216/B263). The three analogies also correspond to the categories of relation found in the table of the categories, covering, first, substance/attribute, second, cause/effect, and third, community. Kant claims that these three rules of temporal relations of appearances precede and make possible all

[10] See *CPR* B219.
[11] Lucy Allais, *Manifest Reality: Kant's Idealism and his Realism* (Oxford: Oxford University Press, 2015), 6.
[12] Bryan Hall. *The Post Critical Kant: Understanding the Critical Philosophy through the Opus Postumum*. (New York: Routledge, 2015), 37.

experience.[13] According to Watkins, Kant explains that we need the three rules because we cannot see the time determination with which the analogies, especially the second and third, are centrally concerned.[14]

Henry Allison argues that, "although the bulk of critical attention remains focused on the second analogy, it has become increasingly recognized that the analogies can only be properly understood if taken together."[15] In order to show that all the analogies are equally important, especially when read alongside Kant's more scientific works, I will be focusing on the arguments from the first and third analogies in this thesis. This chapter will examine the first analogy, and, after a brief look at the second analogy, the next chapter will focus on the largely overlooked third analogy. I hope to show that Allison is correct in his acknowledgement that it is crucial to examine the analogies as a whole.

III. Change and Persistence

Since time itself is unperceivable, Allison explains that "it becomes necessary to presuppose some perceptually accessible model for time itself as a condition of the possibility of determining the temporal relations of appearances."[16] Consequently, Kant argues for the necessity of enduring entities, claiming that empirical knowledge of the creation or cessation of any object *ex* or *in nihilo* is impossible. Andrew Ward explains

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[13] See *CPR* A177/B219.
[14] Eric Watkins, "Kant's Model of Causality: Causal Powers, Laws, and Kant's Reply to Hume," *Journal of the History of Philosophy* 42, no. 4 (2004): 192.
[15] Henry Allison, *Kant's Transcendental Idealism* (New Haven: Yale University Press, 2004), 229.
[16] Allison, *Transcendental Idealism*, 239.

that, if absolute ceasing to exist or coming to exist "were a possible experience, it would mean that there must have existed a period of time, however small, in which *nothing* could have been perceived to happen."[17] As Bryan Hall points out, a substance arising absolutely would have to arise "from an empty time, otherwise it would arise from some prior existence, and so the arising would not be absolute."[18] Hall continues: empty time is no object of possible experience as it "offers no way of connecting this arising with anything previously existing within the temporal continuum."[19] Therefore, as Allison explains, when we experience the arising or perishing of a substance, we must really be experiencing the arising or perishing of a particular configuration or determination of an already existing substance.[20]

In the first edition of the *Critique of Pure Reason*, the general principle of the first analogy is: "all appearances contain that which persists (substance) as the object itself, and that which can change as its mere determination, i.e., a way in which the object exists" (*CPR* A182/B224). Then, in the formulation of the principle in the B edition – "in all change of appearances substance persists, and its quantum is neither increased nor diminished in nature" (*CPR* A182/B224) – it is implied that one particular substance or set of substances endures throughout all change.

Kant proposes a 'substratum' which embodies the unchangeableness or persistence which he attributes to time itself. Without some persisting thing, everything

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[17] Andrew Ward, *Starting with Kant* (New York: Continuum International Publishing Group, 2012), 53.
[18] Hall, *Post Critical Kant*, 40.
[19] Hall, *Post Critical Kant*, 40.
[20] Allison, *Transcendental Idealism*, 243.

would be in constant flux and we could not be aware of succession or simultaneity. Allison argues that "an enduring, perceivable object (or objects) is required to provide the backdrop or frame of reference by means of which the succession, simultaneity, and duration of appearances in a common time can be determined."[21]

James Van Cleve accepts that Kant is able to prove that all changes take place *against* the backdrop of something permanent, but he worries that Kant's argument "does not prove that any change is an alteration *in* that permanent something, or even that it is an alteration in anything at all."[22] Giving an example, Van Cleve suggests that if we take the sun to be a permanent backdrop in the sky, "things under the sun are still free to pop into and out of existence as they please."[23] As this would violate the maxim that nothing can arise *ex nihilo*, Van Cleve argues that "for this purpose the Backdrop Argument is seriously wanting."[24] Like Van Cleve, Arthur Melnick defines the substratum functionally. Arguing that the different time intervals may be determined based on different appearances, Melnick believes that the substratum "is defined relative to the interval that it serves to determine."[25] Melnick suggests that one time interval may be determined relative to the motion of the sun, while the decay of an element may be the substratum of the determination of the time interval between other events.[26]

Paul Guyer argues against Van Cleve and Melnick's interpretation of the

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[21] Allison, *Transcendental Idealism*, 239.
[22] James Van Cleve, *Problems from Kant* (New York: Oxford University Press, 1999), 108.
[23] Van Cleve, *Problems*, 108.
[24] Van Cleve, *Problems*, 108.
[25] Arthur Melnick, *Kant's Analogies of Experience* (Chicago: University of Chicago Press,1974), 61.
[26] Melnick, *Analogies of Experience*, 61-62.

Backdrop Argument, insisting that they are misunderstanding the goal of the first analogy:

> it can be objected, of course, that such an argument does not establish the endurance of *all* substances, but only of whatever substance happens to be chosen to function as the clock for others, and that it does not even establish the true permanence of *that* substance, since a consistent and continuing system for measuring duration could be operated using several different and successively existing clocks (or objects functioning as such), as long as the periods of these were correlated during periods of overlapping existence prior to the cessation of the existence of one clock but subsequent to the commencement of the next.[27]

Guyer explains that Kant is not arguing for the permanence of substance as a tool for measuring the duration of particular objects, events, or processes in time.[28] According to Guyer, Kant's argument has nothing to do with particular objects like suns or planets functioning as clocks. Guyer explains that "Kant's argument has nothing to do with the measurement of the duration of specific objects or events *in* time; it concerns only the permanent duration *of* time itself, and even then has nothing to do with the assignment of any numerical magnitude to this permanence."[29] According to Guyer, Kant does not intend to provide conditions for assigning measurements to periods of time. Instead, Kant intends to provide conditions for how objects can have relations of succession or coexistence despite the constant flux of objects in necessarily permanent time.[30] The idea of substance as a tool for measuring rather than as some enduring entity or entities

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[27] Paul Guyer, *Kant and the Claims of Knowledge*. (Cambridge: Cambridge University Press, 1987), 218.
[28] Guyer, *Claims of Knowledge*, 218.
[29] Guyer, *Claims of Knowledge*, 218.
[30] Guyer, *Claims of Knowledge*, 219.

underlying change would not help Kant's argument against the possibility of things absolutely arising or ceasing to exist. What Kant has in mind when he argues for the necessity of something persisting through the changes we perceive in the world is the idea of substance as some enduring entity or entities acting as a substratum underlying the changes we perceive.

Kant makes it clear that we cannot experience a total replacement change of substances. In order to guarantee the unity of temporal experience, Kant argues that something must endure through the perishing of one substance and the arising of another. To illustrate the impossibility of experiencing total replacement change, Allison uses an apparent replacement change of his desk into his bookshelf as an example: "I perceive my desk at *t1* and my bookcase at *t*2, but I do not infer from the succession of perceptions that a replacement change has occurred, that is, I do not assume that the desk has somehow 'become' or been changed into the bookcase."[31] If, during the interval between t1 and t2, the desk was removed and a bookcase was put in its place, we would experience this as a change, but we would not assume that a replacement of substance has taken place.

Nagel notes a problem that arises with only relatively persisting substances, but no underlying substance: if an object could change to be new in respect of its substance, then it could undergo any change whatsoever.[32] As illustrated with Allison's bookcase example, this would disrupt the unity of temporal experience. Instead, we must recognize

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[31] Allison, *Transcendental Idealism*, 241.
[32] Nagel, *Structure of Experience*, 149-150.

that all change is a change of state of what remains or is permanent. Although this does not mean that empty space or time is impossible, Kant is clear that, for beings like us, the *experience* of empty space or time is impossible.

Kant argues in the first analogy that even in the case of what seems to be a genuine replacement change, such as when a desk burns, we refer to the change as an alteration of the states of some substance common to the wood which made up the desk and the ash and smoke which remain after the combustion has taken place.[33] Van Cleve adds that, although combustion can appear to involve a replacement change in which wood is replaced by smoke and ash, Kant is clear that the change we experience is the mere alteration of more fundamental substances out of which wood, smoke and ash are formed. Without assuming the permanence of some substance, we could experience the wood, or the parcel of substance constituting the wood, as absolutely ceasing to exist as two new parcels of substance, the ash and smoke, come into existence *ex nihilo*. Such a change could be called a substance-change.

However, Kant denies that the change can be viewed as a substance-change.[34] Following his argument, when a thing begins to be, it must be attached to something which already existed. As an example, Kant writes,

> a philosopher was asked: How much does the smoke weigh? He replied: If you take away from the weight of the wood that was burnt the weight of the ashes that are left over, you will have the weight of the smoke. He thus assumed as incontrovertible that even in fire the matter (substance) never disappears but rather only suffers an alteration in its form (*CPR* A185/B228).

[33] Allison, *Transcendental Idealism*, 241.
[34] Andrew Ward, *Kant: The Three Critiques* (Cambridge: Polity Press, 2006), 68.

When experiencing the change from wood to ashes and smoke, we must accept that there is no substance-change, but only a change in the state of the original, underlying, parcel of substance. As Ward explains, when the substance constituting the wood seems to cease to exist absolutely and the substance constituting the ash and smoke seems to come into existence absolutely, there is merely a "*rearrangement* of the original amount of substance."[35]

Transition from non-being to being can only be empirically cognized as changing determinations of that which lasts. Since arising or perishing can only be possible perceptions if they concern determinations of things which persist, any change, or something's coming into being or passing away, is an *alteration* of something.[36] As Van Cleve puts it, the premise that all change is alteration leads to the conclusion that all change is alteration of substance.[37] In Kant's own words, "alteration is a way of existing that succeeds another way of existing of the very same object. Hence everything that is altered is lasting, and only its state changes" (*CPR* A188/B 231). Kant claims that anything arising or perishing in time must be an alteration of a substance persisting in time. Kant differentiates between change and alteration. According to Kant, "everything that is altered is lasting, and only its state changes" (*CPR* A187/B230), meaning that it would not be possible to have a unity of experience if new substances could arise or perish from or into nothing. Van Cleve reminds us that, to Kant, "to change is simply to

[35] Ward, *Three Critiques*, 67-68.
[36] See *CPR* A188/B231.
[37] James Van Cleve, "Substance, Matter, and Kant's First Analogy," *Kant-Studien* 70, no. 2 (1979): 154.

come to be or cease to be; and to alter is to come to exemplify or to cease to exemplify a certain property."[38] As Kant explains, "alteration is a way of existing that succeeds another way of existing of the very same object" (*CPR* A187/B230).

Van Cleve uses an autumn leaf as an example to show the difference between change and alteration: he argues that, when a leaf turns from green to orange, the colour changes as the green ceases to be and the orange comes to be, while the leaf alters in respect of the colours.[39] According to Kant, the change concerns determinations which can cease or begin to be, while alteration refers to states of the lasting substance. Therefore, as states Van Cleve, "to change is simply to come to be or cease to be; and to alter is to come to exemplify or to cease to exemplify a certain property. Kant would say that when an autumn leaf turns from green to gold, the colors [sic] change while the leaf alters in respect of them."[40] Almost paradoxically, Kant argues, only substance, or that which persists, can be altered.[41]

IV. Relative versus Absolute Persistence

Kant is clear that substance must persist throughout all chances. However, Guyer points out that Kant is not clear about what counts as a substance. According to Guyer, Kant "only indirectly identifies the permanent objects thus introduced with substances in the merely relatively enduring sense of that which endures through some change of

[38] Van Cleve, "Substance, Matter," 151.
[39] Van Cleve, "Substance, Matter," 152.
[40] Van Cleve, "Substance, Matter," 152.
[41] *CPR* A188/B 231.

accidents."[42] Adamant that ordinary empirical objects, such as tables or moons, cannot count as substances, Guyer argues that Kant uses the word 'substance' to refer to something more fundamental. He argues that objects such as tables and moons are determinations of substance which can begin or cease to be as part of a substance that remains through *all* transformations.[43] Arguing that Kant must require something more than relatively enduring substances, Guyer even disagrees with the idea that wood, ash, and smoke are substances themselves. Kant writes in the first analogy, "even in fire the matter (substance) never disappears but rather only suffers an alteration in its form" (*CPR* A185/B228). Guyer takes this to mean that wood, ash, and smoke "are only a variety of forms which some substance common to them all can take on."[44] Guyer argues that wood, ash, and smoke are "nothing but determinations of substance, which can begin or cease to be, but the substance itself must remain through all such transformations, as a condition of our knowledge of the occurrence of any actual transformation."[45]

Guyer argues that, to Kant, substance is identified as whatever ultimately endures through any empirically discoverable change. If matter is what endures, then matter is substance,

> but if it is only a constant quantum of matter-cum-energy which endures, then from the philosophical point of view, *that* is what must be regarded as substance. That substance endures, and that all that exists is ultimately reducible to substance, are philosophical points; the question of what substance actually is is a scientific question.[46]

[42] Guyer, *Claims of Knowledge*, 216.
[43] Guyer, *Claims of Knowledge*, 233.
[44] Guyer, *Claims of Knowledge*, 233.
[45] Guyer, *Claims of Knowledge*, 233.
[46] Guyer, *Claims of Knowledge*, 233.

Guyer argues that, since what counts as a substance is inferred from what it is that endures, when our beliefs about what endures change, our conception of what is a substance also changes.[47]

Criticizing Jonathan Bennett's example using a porcelain pig to illustrate a substance which ceases to exist, Guyer argues that "Kant would not treat something such as a porcelain pig as a genuine substance. This is precisely because, even without considering a made-up case like Bennett's, we would never think of something such as that as anything other than a relatively enduring object."[48] Guyer argues that a porcelain pig can be pulverized into dust, which can be broken down into elements and so on. What is a substance in the case of an object such as a porcelain pig is, as Guyer writes, "*whatever* it is that endures through all such transformations, whether that be earth, air, fire, and water (on one, to be sure, no longer very attractive empirical theory) or quarks (on another theory)."[49]

Like Guyer, Nagel argues that there is something more fundamental underlying our experience of relatively enduring substance in which the individual enduring substances' properties, qualities, and attributes inhere. Nagel suggests that Kant's theory of substance shows that we perceive types of matter more basically than we perceive particular, individual objects.[50] Nagel asserts that, "rather than relate first to the world's separate objects and then gather them into kinds according to their material compositions,

[47] Guyer, *Claims of Knowledge*, 234.
[48] Guyer, *Claims of Knowledge*, 232.
[49] Guyer, *Claims of Knowledge*, 232-233.
[50] Nagel, *Structure of Experience*, 120.

we relate first and fundamentally to various sorts of matter."[51] That is, we relate first and more fundamentally to, for example, milk, water, wood, soap, skin, hair, cloth, metal, etc., before relating to and making generalizations from each of the world's separate objects.[52]

Nagel argues that, to Kant, substance, or matter, is the basic stuff of the world.[53] It is essentially permanent and "endures throughout time as the stuff out of which all physical bodies are made, and to which they all in time return."[54] Substance connects differences between different moments related to each other by virtue of their related material content.[55] Nagel argues that, even when a new object begins through changes involving birth or manufacture, for example, we account for the change based on what existed before the beginning of the new object.[56] Nagel insists that "such changes of substances must themselves be grounded in more fundamental substances, until finally we get to matter."[57]

Allison observes that up to this point, there has been no reason to understand substance as referring to something absolutely persistent.[58] So far, nothing more is required than "enduring, reidentifiable entities that function as substrata of change."[59] However, argues Allison, the objective reality of Kant's "schema of the pure concept of

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[51] Nagel, *Structure of Experience*, 120.
[52] Nagel, *Structure of Experience*, 120.
[53] In the First Analogy, Kant uses the terms 'matter' and 'substance' interchangeably.
[54] Nagel, *Structure of Experience*, 120.
[55] Nagel, *Structure of Experience*, 150.
[56] Nagel, *Structure of Experience*, 150.
[57] Nagel, *Structure of Experience*, 151.
[58] Allison, *Transcendental Idealism*, 239.
[59] Allison, *Transcendental Idealism*, 242.

substance"[60] may rely on demonstrating something which persists more absolutely. Allison suggests that there are places in the first analogy where it seems as though anything could act as a substance. For example, Kant writes, "in all appearances that which persists is the object itself, i.e., the substance (*phaenomenon*), but everything that changes or that can change belongs only to the way in which this substance or substances exists, thus to their determinations" (*CPR* A183-184/B227). Therefore, it is clear that some substances such as tables, trees, mountains, and planets sometimes act as substrata of change. Yet, they also come into and out of existence themselves.[61] Accordingly, Allison argues that "it seems more reasonable to construe him to be claiming that such changes must be experienced as alterations of something truly substantial that persists throughout all change."[62]

Returning to the burning piece of wood as an example, as Allison does, it is clear that we must assume that the wood "existed for a period of time prior to its destruction by fire and [must] have been capable of being altered in any number of ways during that period without losing its identity."[63] One cannot regard the wood's destruction by fire as merely an alteration of the wood because it is no longer identified as wood at the end of the process. Still, though, the process is regarded as an alteration. Rather than treating the wood as that which alters, that which alters is some matter which assumes the form of wood at one stage and assumes the form of smoke and ashes at another stage. According

[60] Allison, *Transcendental Idealism*, 242.
[61] Allison, *Transcendental Idealism*, 242.
[62] Allison, *Transcendental Idealism*, 242.
[63] Allison, *Transcendental Idealism*, 243.

to Allison, when conceiving such a transformation one must "consider the piece of wood as the temporary form, state, or determination of some enduring matter."[64] Here, matter, like substance, is presupposed to endure throughout the change. Allison believes that, in addition to relatively enduring substances, Kant must be able to establish some entities, or a more fundamental entity, which does persist throughout all time. Allison concludes that there must be at least one perceivable object which endures, providing a backdrop which we can refer to when determining the succession, simultaneity, and duration of appearances in a common time.

V. Two Conceptions of Substance

Hall proposes an answer to the problem of what Kant means by 'substance' by showing that an important distinction can be drawn between the alteration of substances versus Substance. As Hall summarizes the problem, "when Kant talks about substance, he is not always talking about the same thing. There is the relative persistence of individual substances as well as the sempiternal persistence of omnipresent Substance."[65] The word 'substance' in the first analogy could either refer to an omnipresent and sempiternal substance or to ordinary empirical objects.

Hall points out a dilemma that arises when applying the category of substance due to the opposing conceptions of substance in Kant's *Critique of Pure Reason*. Hall states,

> if the category of substance applies to an omnipresent and sempiternal substance, then although this would ensure that all experiences of

[64] Allison, *Transcendental Idealism*, 243.
[65] Hall, "Dilemma," 95.

> empirical objects take place in a common spatiotemporal framework, one could not individuate these empirical objects and experience their alterations. If the category of substance applies to ordinary empirical objects, however, then although one could individuate these substances and experience their alterations, the category would not pick out a common spatiotemporal framework for these experiences.[66]

In this quotation, Hall is clear that, because substances possess states and properties which are not reducible to properties and states of Substance, substances are not reducible to the Substance upon which they supervene.[67] Due to the nature of empirical intuition, the concept which operates at the level of substances is separate and irreducible to the concept which operates at the level of Substance. One cannot take substances simply as parts of Substance because substances are not reducible to Substance. As Hall explains,

> there is the category of substance which, in its role as a principle, applies to those substances that appear in empirical intuition and makes possible (in conjunction with the other principles) the application of the *a priori* concept of . . . Substance which unifies all experiences of substances within a common spatiotemporal framework.[68]

Hall argues that the reason for his distinction between 'substance' and 'Substance' is that Kant uses the same word for two different meanings, like when we differentiate between the nails on our fingers and the nails that we use to hold houses together. Hall concludes that relatively enduring empirical objects which persist through the alterations of their properties, as seen when a leaf changes colour, are substances, and Substance refers to a "one sempiternal and omnipresent Substance whose quantum in nature is neither

[66] Hall, "Dilemma," 79.
[67] Hall, "Dilemma," 97.
[68] Hall, "Dilemma," 109.

increased nor diminished."[69]

An example of an alteration of substances could be a leaf changing colour, while burning wood changing into smoke and ash can be an example of Substance enduring through the perishing and arising of substances.[70] Something is an enduring substance as long as it can be considered to "go from the one state to the other and remain in existence throughout the alteration."[71] When a state of Substance alters, it involves a change in which one substance perishes and another substance arises. When the states of substances alter, there is no arising or perishing of substances. To Hall, "it seems as if the alteration of Substance involves a change of states that could not occur at the level of substances and vice versa."[72]

Also distinguishing between two types of substance, Bennett argues that, while Kant's two uses of the word 'substance' are related, it is wrong that they are so often conflated or identified. Bennett doubts that the two types of substance "are even extensionally equivalent."[73] Thus, to Bennett, porcelain might be a substance1, and that which endures through the destruction of porcelain might be substance2.

Like Hall and Bennett, Robert Hanna also suggests that Kant "talks about two distinct levels of the material substrate of empirical nature."[74] Similar to Hall's distinction between substances and Substance, Hanna differentiates between primary and

[69] Hall, "Dilemma," 80.
[70] Hall, "Dilemma," 97.
[71] Nagel, *Structure of Experience*, 149.
[72] Hall, "Dilemma," 97.
[73] Jonathan Bennett, *Kant's Analytic* (London: Cambridge University Press, 1966), 182.
[74] Robert Hanna, *Kant, Science, and Human Nature* (Oxford: Clarendon Press, 2006), 392.

secondary substances. When Hanna differentiates between two different meanings of the word 'substance,' he explains that there is primary substance, or 'One Big Substance,' which is a single substratum persisting throughout all time. There is also a plurality of individual secondary substances, the particular material substances or bodies, which persist for a length of time, but which do come in and out of existence.[75] Melnick also agrees, arguing that substrata cannot absolutely come into or out of being, but that does not mean that we cannot allow that new things, meaning new substances, come into being.[76]

It must be noted that neither a substance nor a Substance interpretation of the backdrop thesis can account for absolute arising or perishing. Perception of arising or perishing can only be possible if it concerns merely a determination of something which persists.[77] Kant is clear that the coming or ceasing to be of an object cannot be the absolute generation or corruption of an underlying sempiternal substance. An object's alterations are changes of states or properties of a persisting object. As Kant argues, that which always exists is required for the possibility of experience and "everything that changes or that can change belongs only to the way in which this substance or substances exists, thus to their determinations" (*CPR* A183/B227). In accordance with the first analogy, when thinking of a burning piece of wood or a fallen leaf decaying, we must think of them as alterations of sempiternal substance or substances which underlie the changes of state. From either interpretation, substance persists throughout all change.

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[75] Hanna, *Science and Human Nature*, 392.
[76] Melnick, *Analogies of Experience*, 67.
[77] See *CPR* A188/B231.

VI. Conclusion of Chapter One

To Kant, our experience of the physical world is not possible without a substrate underlying the constant changes. According to either a substances or Substance interpretation of the first analogy, something persists while accidents change. Everyday objects of experience do arise and perish, such as when wood perishes through incineration while smoke and ash arise, but these are alterations of Substance. Regular objects, like tables and stars can, of course, cease to exist, either by breaking apart or exploding. However, to Kant, the substance composing the objects remains. As I have shown, according to Kant's first analogy, in order to have a unity of temporal experience, or if there is a common temporal framework for experience, Substance must be sempiternal and must ensure that things do not arise or perish absolutely. Something must persist because, if there were nothing persisting, everything would be in constant flux and we could not be aware of succession or simultaneity. Since a substance cannot arise out of empty time, meaning out of nothing at all, substances must always arise from some prior existence with which the arising is temporally connected.[78] As Kant explains in the first analogy, temporal relations, such as succession or simultaneity, which will be the focus of my second chapter, are only possible in that which persists through all time.

[78] Hall, "Dilemma," 85.

CHAPTER TWO

I. Introduction to Chapter Two

As I showed in chapter one, Kant is clear that the arising and perishing of substances presupposes something enduring. In other words, when appearances succeed one another, the change of the appearances is always the alteration of something that persists, existing with two opposed determinations. To Kant, all events follow prior events, or prior states of substances. Therefore, Kant examines the temporal relation of 'succession' in the second analogy, explaining the role of cause and effect in determining objective temporal order of appearances. Then, in the third analogy, Kant addresses the problem of substantial interaction, or reciprocal causation. In the third analogy, Kant expands on his concept of substance from the first analogy, now describing a plenum of moving forces of matter in which we must presuppose community, or interaction, between all simultaneous substances throughout the entire universe. It is through this thoroughgoing interaction that our own relative position and motion on the earth and within the cosmos is determined. A problem that arises is that 'thoroughgoing interaction' can be interpreted in different ways. Watkins suggests that the explanations of interaction in the third analogy, *Metaphysical Foundations of Natural Science*, and *Physical Geography* can refer to two different types of interaction. By contrasting Kant's Earth and Moon example in the third analogy with his description of the interaction between the Earth and the Moon in the *Physical Geography*, I will show the importance of the often forgotten third analogy, and the importance of distinguishing between

mediate and immediate interaction.

II. The Relation between the Second and Third Analogies of Experience

The first analogy's arguments about the sempiternality of substance are presupposed in the second analogy, where Kant expands on his claim that anything coming to be presupposes something which already existed. Expanding on his arguments concerning change and alteration, Kant focuses on the possibility of determining appearances as successive in the second analogy[79]. Kant continues his discussion of change and alteration of substances or states of substance(s), now suggesting that substance "manifests itself better and more readily through action than through the persistence of the appearance" (*CPR* A204/B249). Kant focuses on causality in the second analogy, maintaining that "there really are necessary connections between things as they appear" (*CPR* A198/B243). Wherever there is action, which signifies relations of cause and effect, there is substance. As Kant explains, whenever something happens or changes, "the ultimate subject of the changeable is therefore that which persists, as the substratum of everything that changes, i.e., the substance" (*CPR* A205/B250).

Kant differentiates between apprehensions involving a happening and apprehensions not involving a happening. Unlike in an example of apprehension involving a "happening," such as perceiving a ship sailing downstream, in the series of the perceptions of a stationary house, there is no necessary determinate order in which the

[79] The Second Analogy is one of the most heavily scrutinized sections of the First *Critique*, but, in this thesis, it will only be examined insofar as it anticipates the Third Analogy.

manifold must be apprehended and combined (*CPR* A192/B237). With or without a happening, the synthesis of the manifold through the imagination is always successive. For example, when apprehending the appearance of a house, the apprehension is successive, even if no one would concede that the manifold of the house itself is successive (*CPR* A190/B235). However, the order that the representations follow is not determined in the imagination. Our imagination places one state before the other, but we cannot determine the objective relation of the appearances. As Kant puts it, "the apprehension of the manifold of appearance is always successive. The representations of the parts succeed one another. Whether they also succeed in the object is a second point for reflection, which is not contained in the first." (*CPR* A188-189/B234). For a succession of perceptions to be taken as the perception of an event, we must apprehend that one thing which happens follows another thing which precedes in accordance with a rule: "that I cannot arrange the apprehension otherwise than in exactly this sequence" (*CPR* A193/B238). Kant explains that any happening must be temporally related to happenings which precede or follow. The series of happenings cannot be reversible, and the state which follows must follow the preceding state inevitably and necessarily.[80]

Whenever we experience that something happens, we must presuppose that something else precedes and determines each state in the sequence of appearances "and only under this presupposition alone is the experience of something that happens even possible" (*CPR* A195/B240). Without necessary connection between that which precedes and that which follows, "all sequence of perception would be determined solely in

[80] See *CPR* A198/B243.

apprehension, i.e., merely subjectively, but it would not thereby be objectively determined which of the perceptions must really be the preceding one and which the succeeding one" (*CPR* A194/B239). According to Allison, "thereby, there is an order to our representations, each present one pointing to a preceding state as a correlate, necessarily connected in the temporal series"[81]

Kant argues that through relation of cause to effect, appearances and occurrences are necessarily determined in time: "the relation of cause to effect, is the condition of the objective validity of our empirical judgments with regard to the series of perceptions, thus of their empirical truth, and therefore of experience" (*CPR* A202/B247). The principle of causal relation in the sequence of appearances is the ground of the possibility of experience involving causally connected successive appearances.[82] Experience itself is only possible, to Kant, if "we subject the sequence of the appearances and thus all alteration to the law of causality" (*CPR* A188/B234). Allais explains that Kant wants to dismiss the idea that things as they appear to us are mere mental items and "argues that there must be genuine causal relations between appearances."[83]

Kant points out that, while the second analogy mainly focuses on succession, a cause can be simultaneous with its effect. A cause determines the states of another substance, but the cause does not have to be prior rather than simultaneous with its effect. Kant gives another example to illustrate simultaneous causes and effects:

> if I consider a ball that lies on a stuffed pillow and makes a dent in it as a cause, it is simultaneous with its effect. Yet I still distinguish the two by means of the

[81] Allison, *Transcendental Idealism*, 251.
[82] See *CPR* A203/B248.
[83] Allais, *Manifest Reality*, 48-49.

> temporal relation of the dynamical connection. For if I lay the ball on the pillow the dent follows its previously smooth shape; but if (for whatever reason) the pillow has a dent, a leaden ball does not follow it. The temporal sequence is accordingly the only empirical criterion of the effect in relation to the causality of the cause that precedes it. (*CPR* B248-249)

As the example of a ball and pillow shows, causal relationships do not require perceived succession. The third analogy, which will be the focus of this chapter, builds on the idea of simultaneous causes and effects.

The argument of the third analogy closely parallels the argument of the second analogy. The similarity has led many Kant scholars to dismiss the third analogy, arguing that having a whole section devoted to simultaneity is redundant. Melnick, for example, writes that the separation of the argument of the second and third analogies is "artificial and forced."[84] Bennett is particularly scathing, writing that "the third analogy, concerning community, does not require extended discussion" because the argument of the third analogy "is a failure which is not even incidentally valuable except for a few flickers of light which it throws on the second analogy."[85]

Additionally, in the first edition of *Kant's Transcendental Idealism*, Allison does not criticize or dismiss the third analogy. He ignores the section almost altogether. Mentioning the third analogy in passing, Allison says no more about the analogy than to say that Kant "appears to treat 'thing' and 'substance' as if they were interchangeable terms, and to understand by 'substance' enduring physical objects."[86] However, by the

[84] Melnick, *Analogies of Experience*, 96.
[85] Bennett, *Kant's Analytic*, 181.
[86] Henry Allison, *Kant's Transcendental Idealism: An Interpretation and Defense*. (New Haven: Yale University Press, 1983), 215.

2nd edition of Allison's book, he includes a large section on the third analogy, criticizing other authors for their dismissal of the analogy. Allison acknowledging that the third analogy closely mirrors the second analogy and has "the appearance of redundancy, stemming from the fact that, like the second analogy, it too deals with causality, albeit of the reciprocal variety."[87] However, Allison argues in the second edition of *Transcendental Idealism* that the third analogy "has a distinct and equally essential function as a condition of experience."[88] I agree with Allison that the third analogy is important in its own right, rather than as merely an embellishment of the second analogy's argument.

Watkins echoes the argument that the third analogy closely follows the second. However, he differs from Melnick and Bennett, asserting that the similarity between the two analogies "makes it surprising that the third analogy has been curtly dismissed or even ignored altogether by the vast majority of commentators on the second analogy."[89] Similarly, Hanna argues that, even though the second analogy is known as the most famous and important of the analogies, the second analogy is not logically independent of the first and third analogies. "In fact," argues Hanna, "the second analogy is both conceptually and metaphysically complementary to the other two analogies, and can neither be understood in theory nor obtain in reality without them."[90] I will show that when we look to Kant's later or more scientific works, such as *Metaphysical Foundations of Natural Science*, *Opus Postumum*, and the *Geography*, the third analogy can no longer

[87] Allison, *Transcendental Idealism*, 261.
[88] Allison, *Transcendental Idealism*, 261.
[89] Watkins, *Metaphysics of Causality*, 217.
[90] Hanna, *Science and Human Nature*, 395-396.

be considered redundant.

III. Simultaneity and Coexistence

Kant argues in the third analogy that "things are simultaneous if in empirical intuition the perception of one can follow the perception of the other reciprocally" (*CPR* B257). Differing from Kant's arguments in the second analogy, in the third analogy he argues that "things are simultaneous insofar as they exist at one and the same time" (*CPR* 211/B256), meaning that the order of the synthesis of apprehension of this manifold is indifferent. Unlike the irreversible order or apprehension in experiences of succession, Kant argues that the order of apprehension for several substances coexisting must be indifferent or reversible, meaning that a sequence of states of affairs must be reversible and could be represented in the opposite order. That is, things are simultaneous if one can begin the apprehension at A and proceed from A through B, C, and D, to E, as well as from E to A.[91]

Kant uses directing our gaze indifferently from the Moon to the Earth or from the Earth to the Moon as an example to illustrate our experience of simultaneity. He writes, "I can direct my perception first to the Moon and subsequently to the Earth, or, conversely, first to the Earth and subsequently to the Moon, and on this account, since the perceptions of these objects can follow each other reciprocally, I say that they exist simultaneously" (*CPR* B257). To have the experience of the Earth and the Moon

[91] See *CPR* A211.

coexisting, we must recognize that we could have apprehended the representations of the Earth and the Moon in the reverse order. For example, when one experiences the coexistence of the Earth and the Moon over a period of time, one might first begin with a perception of the Earth succeeded by the Moon, but in order to experience coexistence, it must have been possible to first perceive the Moon and then the Earth. As Ward explains, "it is, Kant holds, the recognition that the order of my apprehension could have been reversed, at any moment during my apprehension of the manifold, which alone enables me to think that while my apprehension of the manifold is successive, what I am apprehending is not in succession but coexistence in space."[92]

As Béatrice Longuenesse explains, even if we might never perceive the Moon at the same time as we perceive the surface of the Earth, we nevertheless do experience these objects as simultaneously existing. Longuenesse writes,

> we nevertheless perceive a subjective succession in apprehension as an objective simultaneity of things under specific states, if we are aware of the subjective succession as being order-indifferent. For example, we are aware that we could direct our gaze indifferently from the moon to the earth or from the earth to the moon; it is in this way that, even though we might never perceive at the same time the moon at its zenith and the surface of the earth, we do experience these objects as simultaneously existing.[93]

Similarly, Allais explains that, "when one thing is coexistent with another, the former exists while we are looking at the latter—i.e. the former exists unperceived."[94] Allais

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[92] Ward, *Starting with Kant*, 62.
[93] Béatrice Longuenesse, "Kant's Standpoint on the Whole Disjunctive Judgment, Community, and the Third Analogy of Experience," in *Kant and the Concept of Community*, eds. Charlton Payne and Lucas Thorpe (Woodbridge: Boydell & Brewer Limited, 2011), 30.
[94] Allais, *Manifest Reality*, 48.

adds that, "Kant contrasts the continued existence of simultaneously existing objects with our successive perceptions of simultaneously existing objects."[95] We do not perceive all simultaneous things at once, but, unlike perceptions which come to be and cease to be, things exist even when we are not looking at them.

IV. Thoroughgoing Interaction

As Kant explains, "simultaneity is the existence of the manifold at the same time" (*CPR* B257). However, the third analogy goes further than saying simply that objects coexist. Kant contends that we can only have knowledge of objective simultaneity or coexistence if we assume that substances stand in thoroughgoing community or mutually interact with each other. The simultaneity of substances can only be cognized in experience if all substances in appearance are presupposed to stand in dynamical community, simultaneously determining the position of one another in time. As he argues, "it is necessary for all substances in appearance, insofar as they are simultaneous, to stand in thoroughgoing community of interaction with each other" (*CPR* A213/B260). Nagel explains that the experience of objective coexistence, which is evident when one substance acts on another, requires more than merely substances being intuited at the same time.[96] According to Nagel, we apprehend various appearances at the same time, all present together in sense and Kant must answer "whether they coexist merely in sense, or

[95] Allais, *Manifest Reality*, 48.
[96] Nagel, *Structure of Experience*, 195.

in the manifold of appearance."[97] As Longuenesse explains, Kant's principle claim in the third analogy is that all things we perceive as existing simultaneously must "exist in relations of universal interaction or, in Kant's terms, of dynamical community."[98]

According to Kant, "the relation of substances in which the one contains determinations the ground of which is contained in the other is the relation of influence, and, if the latter reciprocally contains the ground of the determinations of the former, it is the relation of community or interaction" (*CPR* B257-58). In the third analogy, Kant maintains that all objects coexisting in space are in mutual causal connection, according with the law of community, or the principle of coexistence. As Jay Rosenberg makes clear, it is through mutual interaction that items can be in a dynamical community, composing a composite rather than a mere collection.[99] To Kant, without community, perceptions of appearances in space would be broken off from one another. If every perception were broken off from all the other perceptions, experience would start new with every new object, without being connected spatially or related temporally with the previous perceptions, or objects.[100] Kant reiterates that he does not refute empty space, but maintains that it can only exist where perceptions do not reach, "and thus where no empirical cognition of simultaneity takes place. There, it is hardly an object for our possible experience" (*CPR* A214/B261).

Watkins explains that, in Kant's account of mutual interaction, substances and

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[97] Nagel, *Structure of Experience*, 195.
[98] Longuenesse, "Kant's Standpoint of the Whole Disjunctive Judgment," 18.
[99] Jay F. Rosenberg, *Accessing Kant: A Relaxed Introduction to the Critique of Pure Reason* (New York: Oxford University Press, 2005), 232.
[100] See *CPR* A214/B261.

their causal powers are independent and distinct from one another, but one substance's causal activity depends on the causal activity of another substance and vice versa, the substances involved jointly determining their states.[101] Watkins continues, explaining that when substances act, exercising their causal powers, each substance depends on external conditions brought about by the activity and causal powers of other substances in each particular situation.[102]

Watkins uses ballroom dancing and tug-of-war to illustrate the joint, or reciprocal, determination which underlies mutual interaction. In both cases, the effect requires at least two people moving "together in choreographed ways to form one pair of dancers doing the foxtrot just as two teams must both be pulling on the same rope in opposite directions for it to be a game of tug-of-war."[103] One person alone could not do these activities; the activities require "the joint causal activity of a plurality of agents"[104] Likewise, things represented as existing simultaneously "must reciprocally determine their position in one time and thereby constitute a whole" (*CPR* A214/B261).

Kant asserts that we could not experience simultaneity in a manifold of completely isolated substances. To Kant, simultaneous substances must mutually determine each others' position in time, simultaneously containing "the causality of certain determinations in the other and the effects of the causality of the other" (*CPR*

[101] Eric Watkins, "Making Sense of Mutual Interaction: Simultaneity and the Equality of Action and Reaction," in *Kant and the Concept of Community*, eds. Charlton Payne and Lucas Thorpe (Woodbridge: Boydell & Brewer Limited, 2011), 49.
[102] Watkins, "Making Sense of Mutual Interaction," 49.
[103] Watkins, "Making Sense of Mutual Interaction," 49.
[104] Watkins, "Making Sense of Mutual Interaction," 49.

A212-13/B259). As I will show in the next section, for simultaneity of substances to be cognized in possible experience, the substances must stand in either mediate or immediate dynamical community.

V. Immediate versus Mediate Interaction between Distant Objects

Kant describes a situation of thoroughgoing mutual interaction throughout the entire cosmos: the interaction between the Earth and the other heavenly bodies. Examining the mutual interaction between distant objects, such as the Earth and the Moon, as the ground for our perception of their simultaneity, Kant remarks that such dynamical community could be either immediate or mediate. Graham Bird clarifies Kant's differentiation between different types of continuity. He suggests that immediate continuity concerns the "impersonal continuity and identity of objects over time when they are noncontinuously perceived."[105] Mediate continuity concerns the perceiver's continuity with the perceived objects.

Due to the contrast between mediate and immediate continuity, or interaction, I will argue that the 'thoroughgoing interaction' is unspecified in the third analogy. Watkins uses the words 'weak' and 'strong' when describing two different types of thoroughgoing interaction that relate to different types of continuity.[106] According to Watkins, a weak interpretation of thoroughgoing interaction would claim that it can be mediately that each

[105] Graham Bird, *The Revolutionary Kant: A Commentary on the Critique of Pure Reason* (Chicago: Open Court, 2006), 477.
[106] Eric Watkins, "Kant's Third Analogy of Experience," *Kant-Studien* 88, no. 4 (1997): 424.

substance acts on and is acted on by every other simultaneous substance.[107] From a weak interpretation, substances which are not directly interacting with each other are in mediate dynamical community, rather than immediate dynamical community.[108]

Watkins suggests that celestial bodies and the light that passes between them can be used as an example of how a weak interpretation could work. The light establishes a 'mediate community' between the celestial bodies – and between oneself and these bodies. While we may not interact immediately with celestial bodies, we do interact immediately with the light that allows our perception of the distant objects, and which in turn interacts immediately with the celestial bodies. Thus, we are "in interaction with these bodies mediately."[109]

To help distinguish between mediate and immediate reciprocal influence or community, Watkins proposes the idea that the relation of community and interaction can be transitive. Allison agrees and takes 'transitive interaction' to mean that "if A stands in a dynamical community with B and B with C, then A and C are similarly related, even though (apart from gravitational attraction) there may be no direct interaction between them."[110] According to Allison, Kant suggests that one can establish an observer's coexistence with remote objects in space with merely a mediate community affected by intervening rays of light.[111] From a weak interpretation of thoroughgoing interaction, the order in which order-indifferent perceptions are perceived is empirically significant, but

[107] Watkins, *Metaphysics of Causality*, 227.
[108] Nagel, *Structure of Experience*, 200.
[109] Watkins, *Metaphysics of Causality*, 227.
[110] Allison, *Transcendental Idealism*, 273.
[111] Allison, *Transcendental Idealism*, 273.

the significance pertains to the perceiver, not to the objects perceived. Although interacting substances add material conditions and, thereby, give empirical significance to the spatial conditions under which substances are apprehended, the significance depends on what the perceiver does and how the perceiver encounters the objects.

Watkins argues that a strong interpretation of the term thoroughgoing "would suggest that each substance acts on and is acted on by every other simultaneously existing substance immediately or directly."[112] Relating to the substance argument from the first analogy, Kant argues that we cannot have an experience of empty space and claims that substance everywhere allows us to perceive our position in space and establish the simultaneity and coexistence of even distant objects.[113] The emphasis on substance everywhere leads Watkins to believe that more than mediate community is involved in Kant's thoroughgoing interaction. While a weak interpretation holds that interaction may be indirect, a strong interpretation of thoroughgoing interaction maintains that all substances directly interact with all other substances to some degree. From a strong interpretation of thoroughgoing interaction, more than merely a mediate community of objects and rays of light is necessary to establish an observer's coexistence with remote objects in space.

According to a strong interpretation of thoroughgoing interaction, all simultaneous substances must stand in relations of genuine dynamical community, all substances mutually causing certain determinations of all other substances.[114] Watkins

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[112] Watkins, *Metaphysics of Causality*, 227.
[113] See *CPR* A213/B260.
[114] See *CPR* A212/B259-60.

insists that this stronger interpretation of thoroughgoing interaction involves the interaction of matter and forces. Watkins proposes that Newton's universal attraction could be the model for this strong interpretation, as could any universal attraction which allows that "any given substance with mass (and located in a common space) acts on and is acted on by every other substance with mass from any point in space, regardless how large or small and how far apart or close together they may be."[115]

Watkins explains that, according to a strong interpretation of thoroughgoing interaction, in order to determine that a table and mars exist simultaneously, it would have to be determined that the table and Mars interact directly, or that Mars exerts gravitational force on the table while the table exerts gravitational force on Mars.[116] According to a weak interpretation of thoroughgoing interaction, connection via gravity is not excluded, but a mediating chain of interaction via the other substances, leading from Mars to the table, would be sufficient.[117]

Allison agrees with Watkins that we must note that appealing to universal gravitation does not preclude the weak interpretation because the weak interpretation "allows for both direct and indirect interaction."[118] In fact, Allison argues that the weak interpretation makes better sense of the argument of the third analogy, according better with the text where "Kant himself explicitly distinguishes between an immediate and mediate community (a distinction that remains completely mysterious on the strong

[115] Watkins, *Metaphysics of Causality*, 227.
[116] Watkins, "Third Analogy," 424.
[117] Watkins, "Third Analogy," 424.
[118] Allison, *Transcendental Idealism*, 272.

interpretation)."[119] At A213/B260 in the *Critique of Pure Reason*, Kant seems to argue that the establishment of a mediate community is sufficient for determining coexistence. Kant argues that,

> from our experiences it is easy to notice that only continuous influence in all places in space can lead our sense from one object to another, that the light that plays between our eyes and the heavenly bodies effects a mediate community between us and the latter and thereby proves the simultaneity of the latter, and that we cannot empirically alter any place (perceive this alteration) without matter everywhere making the perception of our position possible; and only by means of its reciprocal influence can it establish their simultaneity and thereby the coexistence of even the most distant objects (though only mediately). (*CPR* A213/B260)

Similar to his argument in the first analogy, Kant is clear in the third analogy that our experience of things in the world relies on matter everywhere, which here creates a mediate community that makes our perception of distant objects possible. As Nagel indicates, a weak interpretation of thoroughgoing interaction allows perceivers to be the mediators between objects that coexist, all things in experience having a connection with one another through our experience.[120]

However, other works seem to be more consistent with a strong interpretation of thoroughgoing interaction. Watkins suggests that "it is quite possible that Kant could be both holding the weak interpretation here, while elsewhere attempting to demonstrate universal attraction."[121] To illustrate Kant's preference for a strong interpretation, I will turn to the *Metaphysical Foundations of Natural Science*, where Kant introduces moving

[119] Allison, *Transcendental Idealism*, 272.
[120] Nagel, *Structure of Experience*, 200.
[121] Watkins, *Metaphysics of Causality*, 228.

forces of matter to his discussion of thoroughgoing interaction. Then, I will examine the *Physical Geography*, where Kant makes it clear that the Earth and the Moon interact with one another through relations of moving forces.

VI. The *Metaphysical Foundations of Natural Science*

In the *Metaphysical Foundations of Natural Science*, Kant expands on his writings in the analogies of experience, giving more concrete explanations of how mutual interaction can be understood. He makes it clear that the explanation of the moving forces of matter is directly related to the analogies of experience. Relating to the analogies of experience, Kant writes that the propositions of the *Metaphysical Foundations* "precisely answer to the categories of *substance*, *causality*, and *community*, insofar as these concepts are applied to matter" (*MFNS* 4:551). To recap, Kant establishes in the third analogy that all appearances perceived as existing simultaneously exist in relations of immediate or mediate thoroughgoing reciprocal influence. The third analogy's idea of community is echoed in the *Metaphysical Foundations*, where Kant explains that, "from general metaphysics we must borrow the proposition that all external action in the world is *interaction*" (*MFNS* 4:544).

Allais insists that it is in the *Metaphysical Foundations* that "Kant's view that matter, as appearance, consists only of relations or forces is fleshed out in greatest detail."[122] Allais continues, explaining that, in the *MFNS*, "Kant explains the space-filling

[122] Allais, *Manifest Reality*, 225.

property of matter, impenetrability, in terms of opposed forces rather than solidity, saying that attractive and repulsive forces constitute the essence of matter."[123] Similarly, Friedman explains that, in the *MFNS*'s account of dynamical community, all bodies or substances in genuine dynamical community change relative to one another while they exert equal and opposite forces on one another, each substance causing certain determinations in the other substances.[124] As Kant writes, "all *active* relations of matters *in space*, and all changes of these relations, insofar as they may be *causes* of certain actions or effects, must always be represented as mutual" (*MFNS* 4:545). Relating to the third analogy, the *MFNS* makes it clear that, as Friedman puts it, "a relation of interaction occurs when substances mutually exert influences or external forces on one another."[125] In the *MFNS*, Kant introduces two fundamental dynamical forces, attraction and repulsion, as universal properties of all matter. According to Kant, "no *communication* of motion takes place, except insofar as we presuppose a *community* of these motions" (*MFNS* 4:548). As Konstantin Pollock explains, to Kant, matter "presupposes an original attraction opposed to the original force of expansion."[126] The constitution of outer objects is determined by this conflict of forces.[127]

Watkins uses billiard balls as an example to illustrate the conflict of jointly exercising forces: when one ball hits another, the ball which is hit is caused to move, but

[123] Allais, *Manifest Reality*, 225.
[124] Friedman, *Construction of Nature*, 357.
[125] Friedman, *Construction of Nature*, 354.
[126] Konstantin Pollok, "Fabricating a World in Accordance with Mere Fantasy..."? The Origins of Kant's Critical Theory of Matter," *The Review of Metaphysics* 56, no. 1 (2002): 82.
[127] Pollok, "Fabricating a World," 83.

simultaneously, the ball which caused the other ball to move either stops or changes direction itself. In Watkin's own words, "just as A acts on B, causing it to move, so, too B acts on A, causing it to move in the opposite direction; the action of the one requires the reaction of the other."[128] When two balls communicate, the communication of motion is the whole effect, which is brought about by action and reaction coordinating with each other in a specific way, such that they are equal. Similar to how simultaneous substances must be in mutual interaction, jointly determining each other's states, Watkins argues that action and reaction are distinct forces that require each other, jointly causing the communication of motion between bodies.[129] Kant explains that "in all communication of motion, action and reaction are always equal to one another" (*MFNS* 4:544).

Watkins points out that the strong interpretation of thoroughgoing interaction can be supported by Kant's *MFNS* "since that work presents arguments for universal attraction."[130] Unlike in the third analogy, in the *MFNS*, Kant specifically refers to gravitation as a universal force, explaining that, "the *action* of the universal attraction immediately exerted by each matter on all matters, and at all distances, is called *gravitation*" (*MFNS* 4:518). To Kant, the unity of all simultaneous appearances in time is a product of real relations of interaction between coexisting phenomenal substances. Watkins explains that Kant would hold the strong interpretation "if Kant really does want to restrict the third analogy to spatial substances and if he establishes in the *Metaphysical Foundations* that every spatial substance is immediately related to every other substance

[128] Watkins, "Making Sense of Mutual Interaction," 56.
[129] Watkins, "Making Sense of Mutual Interaction," 56.
[130] Watkins, *Metaphysics of Causality*, 228.

via the mutual interaction of gravity."[131] However, it must be noted once again that the weak interpretation is not inconsistent with the *MFNS* since "the weak interpretation allows for both mediate and immediate mutual interaction."[132] Watkins explains that it is possible for Kant to hold the weak interpretation in some places, while he attempts to demonstrate universal attraction elsewhere.[133] In the next section, I will contrast Kant's example of the Earth and the Moon in the third analogy with his description of the Earth and the Moon in the *Geography*. In the third analogy, the example of the Earth and the Moon may favour a weak interpretation, but the interaction between the heavenly bodies in the *Geography* favours a strong interpretation.

VII. The Earth and the Moon

At the same time as his metaphysics shapes his understanding of geography, geographical explanations are used as metaphors throughout Kant's philosophical works. I believe that Kant's more empirical works, such as his *Geography*, are necessary for properly understanding his metaphysical writings. Therefore, I will show how Kant expands on his Earth and Moon example from the third analogy in the *Geography*, once again using the interaction between the Earth and the Moon to illustrate the communication between distant objects. Doing so, I hope to shed more light on the importance of distinguishing mediate interaction from immediate interaction.

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[131] Watkins, *Metaphysics of Causality*, 228.
[132] Watkins, *Metaphysics of Causality*, 228.
[133] Watkins, *Metaphysics of Causality*, 228.

In the *MFNS*, Kant explains that, "when the earth immediately impels the moon to approach it, the earth acts on a thing that is many thousands of miles away from it" (*MFNS* 4:513). Kant expands on the clear interaction between the Earth and the Moon in the Physical Geography, where he explains that the Moon's influence on the Earth can be seen by studying the tides.[134] Kant explains that "on the Earth everything has its weight towards the center" (*PG* 9:168). All parts of the Earth are attracted to one another, with every body on Earth attracting all the other bodies on Earth.[135] All bodies, to the smallest insect, attract and repulse other bodies, but the greater the mass of a body, the greater the body's attraction. Just as the earth attracts smaller objects like stones, so too do stones and insects attract the earth with similar, though much smaller force.[136] As Kant illustrates, "since the Earth has by far the greatest mass of all bodies on it, it must attract other bodies more strongly than does any other, and it is in this way that the gravitation of all bodies towards the Earth is brought about" (*PG* 9:168).

At the same time as the attraction of the Earth manifests itself on the Moon, Kant explains, it is apparent that the attraction of the Moon manifests itself in the liquids of the Earth because the water in the seas is not at the same level on the side of the Earth facing the Moon as on the sides of the Earth not facing the Moon (*PG* 9:217). According to Kant, the water rises on the side turned towards the Moon because the Moon's attraction makes the water lighter in relation to the Earth. Kant claims in his Physical Geography that the water would be at the same level everywhere and always if the Moon's attraction

[134] See *PG* 9:182.
[135] See *PG* 9:168.
[136] Friedman, *Construction of Nature*, 492.

was not stronger on the side of the Earth facing the Moon than on the side of the Earth facing away from the Moon.[137] He claims that, "as a result, the motion of the water at high and low tides extends to the bottom of the sea, and produces effects such as the waves are incapable of effecting" (*PG* 9:219). As these passages show, the attraction of the Moon is perceptible by only a few bodies on Earth. Even though things on the Earth are closer to the Earth than to the Moon, the attraction of the Moon does manifest itself, as is evident in the case of liquids such as water (*PG* 9:216).

Friedman argues that Kant's illustration of the Earth and the Moon as an example of dynamical community is consistent with a "a situation of thoroughgoing mutual interaction throughout the entire cosmos – including an interaction between the Earth and the other heavenly bodies by means of which our own relative position and motion of the Earth within the cosmos is determined."[138] According to a strong interpretation of thoroughgoing interaction, the unity of all simultaneous appearances is a product of real relations between coexisting phenomenal substances.

Allison points out that, while Kant often depicts interaction as a relation between two substances, we must remember that this is a simplified way to explain what he means by community. Watkins is also troubled by the problem of multiple substances and worries that, "since we have restricted our discussion to only two substances, it leaves open the question of whether considering more complex scenarios changes how mutual interaction must be understood."[139] Allison reminds us that, to Kant, "the dynamical

[137] See *PG* 9:217.
[138] Friedman, *Construction of Nature*, 359.
[139] Watkins, *Metaphysics of Causality*, 227.

community is composed of all the substances that coexist throughout a stretch of time and only the interaction of the complete set of these substances is sufficient to determine their coexistence."[140] Therefore, asserts Allison, it is important to note that the Earth and the Moon coexist not only with each other, but constitute a community collectively with all coexisting substances.[141] Kant himself addresses the multiplicity problem in the MFNS with the example of a cask of beer:

> the thing one calls moving must to that extent be considered as a unity. For example, that matter, as a *cask of beer*, is moved, means something different from the *beer in the cask* being in motion. The motion of a thing is not the same as motion in this thing, but here we are concerned only with the former case. But the application of this concept to the second case is then easy" (*MFNS* 4:483).

Similarly, the water on the Earth is sometimes considered as part of the Earth, and sometimes separate from the Earth, depending on which motion we are concerned with.

In Kant's theory of thoroughgoing interaction, we can appeal either to the role of universal gravitation or the role of light in our perception to understand how substances stand in community with one another. A weak interpretation of thoroughgoing interaction is consistent with the arguments of the third analogy. Alternatively, in the *Physical Geography*, Kant's description of the Earth and the Moon is more consistent with the strong interpretation because the heavenly bodies are connected to one another regardless of their connections with perceivers like us. While Kant hints in the *Critique of Pure Reason* that there is more to interaction than the propagation of light, in other works, such as the *Metaphysical Foundations of Natural Science*, the *Physical Geography*, and, as

[140] Allison, *Transcendental Idealism*, 263.
[141] Allison, *Transcendental Idealism*, 263.

will be shown in chapter three, *Opus Postumum*, it is clear that Kant prefers a stronger interpretation of thoroughgoing interaction for the attraction and repulsion of constantly moving forces of matter throughout all of space.

VIII. Conclusion of Chapter Two

Distinguishing between weak and strong interpretations of thoroughgoing interaction is important in clarifying Kant's writing on interacting objects, especially those that are at a great distance from one another. As I have shown, there is disagreement about whether Kant prefers a weak or strong interpretation of thoroughgoing interaction. Allison maintains that the weak interpretation is sufficient for the third analogy. Watkins disagrees, stating that,

> if Kant really does want to restrict the third analogy to spatial substances and if he establishes in the *Metaphysical Foundations* that every spatial substance is immediately related to every other substance via the mutual interaction of gravity, then Kant would in fact hold the strong interpretation, whether he intends to be arguing for it in the *Critique* or not.[142]

I agree with Watkins' argument that, while the text of the third analogy may favour the weak interpretation, support for the strong interpretation can be found in works such as *The Metaphysical Foundations of Natural Science* and the *Physical Geography*, which present arguments for universal attraction.[143] In my third chapter, I will argue that Kant's preference for a strong interpretation becomes even clearer in the ether deductions of *Opus Postumum*.

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[142] Watkins, "Model of Causality," 228.
[143] Watkins, "Model of Causality," 228.

CHAPTER THREE

I. Introduction to Chapter Three

As I showed in chapter one and chapter two, to Kant, the unity in our experience of a world of interactive objects can be accounted for by suggesting that there is material substratum, or an all-encompassing material field of activity. In other words, our perception of objects in space is part of a system of experience, which Kant explains must come out of a system of moving forces which attract and repulse one another. As a necessary condition of possible experience of the constantly changing physical world, Kant explains that there must be something which is always in existence of which all substances and changes are merely determinations. Expanding on his conceptions of substance, succession, and community in the *Critique of Pure Reason*, Kant's conception of ether in *Opus Postumum* should be understood as the always persisting material in which thoroughgoing interaction takes place. I will argue that Kant's ether deduction is anticipated by his argument for the existence of omnipresent substance in the analogies in the *Critique of Pure Reason*.[144] This chapter will show the importance of ether in the necessary conditions of possible experience, arguing that, while the ether cannot be proven by the arguments of the analogies, Kant's ether proofs are a necessary addition to the analogies of experience in the *Critique of Pure Reason*.

[144] Bryan Hall, "A Reconstruction of Kant's Ether Deduction in Übergang 11," *British Journal for the History of Philosophy* 14, no. 4 (2006): 727.

II. Background on the *Opus Postumum*

Late in his career, Kant grew increasingly worried that there was a gap in his philosophical system. This worry led him to begin a work titled: "The Transition from the Metaphysical Foundations of Natural Science to Physics." Unfortunately, Kant did not live long enough to finish this work, but his unfinished manuscript is available within the compilation of unfinished works titled *Opus Postumum*. Guyer explains that the phrase *Opus Postumum* does not refer to all of Kant's posthumously published writing, but rather to a specific set of manuscripts for a work of the 'transition' from 'metaphysical principles of natural science' to actual physics on which he worked, without bringing it to completion from 1796 until a year before his death in 1804."[145] Within this work are Kant's ether proofs, which he proposes bridge the gap from the Metaphysical Foundations of Natural Science to physics, and which will be the focus of this chapter.

Kant distinguishes between science and nature's "*metaphysical foundations*, which are founded entirely on concepts of the relation of motion and rest of outer objects, and *physics*, which systematically orders the content of empirical knowledge of them" (*OP* 21:402). Kant is clear that "the transition from one form of knowledge to another must be a step only, not a leap; that is, the doctrine of method requires one to *pass* from the metaphysical foundations of natural science to physics – from concepts of nature given *a priori* to empirical ones which yield empirical knowledge" (*OP* 21:387). Kant worries that the gulf between the metaphysical foundations of natural science and physics

[145] Guyer, *Kant's System of Nature and Freedom*, 44.

destroys what is systematic, or scientific in doctrine. Kant argues that, since there cannot be a leap between the two types of science, there must be mediating concepts enabling the transition from one doctrine to the other.[146]

The merely empirical science of nature can never amount to a system. It can amount, at best, to a fragmentary, ever increasing aggregate. Kant explains that "the investigation of nature, in the absence of any principles of classification, can result in no system of physics; for there would arise from it merely an aggregate of particular observations, and how far these might extend cannot be anticipated. This investigation of nature is fragmentary, not systematic" (*OP* 21:484). On the other side, the metaphysical foundations of natural science do yield a certain and complete system. However, they give us no material. As Kant argues, the metaphysical foundations "are divisions for the concept which require to be filled; and mere forms without an underlying material can as little yield a system of experience, as richly distributed material without forms. There must be a transition from the metaphysical foundations of natural science to physics if the science of nature is to become a science of reason" (*OP* 21:474-475). Kant requires a general classification according to concepts *a priori* to form a system, and empirical principles are also needed. According to Kant, "there exists a gulf between the two, over which philosophy must build a bridge in order to reach the opposite bank" (*OP* 21: 475). Kant proposes the concept of ether – "the basis of a system of moving forces which emerges analytically according to concepts" (*OP* 21:233.9-12) – as that which bridges the gulf.

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[146] See *OP* 21:311.

Kant began to work systematically on the transition project in around 1796.[147] Speaking of his manuscript as his *chef d'oeuvre*, Kant hoped the nearly completed work would complete his system. Other times, though, Kant would declare that his work, the keystone of his system, should be burnt after his death. Kant's own sometimes contradictory thoughts about the quality of the project led some early Kant scholars to dismiss the work without inspection, calling it a product of senility. Others were more sympathetic; although the manuscript is unedited and could use polishing, it is not unfinished.[148] Also reassuring, *Opus Postumum* was "virtually completed by the middle of 1801, a time when Kant still enjoyed a fair degree of physical and mental strength."[149] Guyer suggests that we should ignore the repetitive nature of the work because the *Opus Postumum* contains "interesting evidence of Kant's last thoughts about the concept of experience and its role in transcendental philosophy as well as his specific efforts to add *a priori* knowledge of matter to physics beyond these *a priori* principles of motion derived in his *Metaphysical Foundations of Natural Science* of 1786."[150]

Many of the scholars sympathetic to the project, however, were put off by the mess. Kant's *Opus Postumum* is different from other Kant works in its organization: Kant was unable to finish the work, so what we have is an edited version of a manuscript that was still in the process of being polished. Although Kant is often criticized for his monstrously long sentences, none compare to some found in this work. For instance, one

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[147] See *OP* xxxvi.
[148] See *OP* XV.
[149] See *OP* xxviii.
[150] Paul Guyer, *Kant's System of Nature and Freedom: Selected Essays* (New York: Oxford University Press, 2005), 44.

sentence "contains no fewer than 225 words, but only one comma" (*OP* xxv). Finally, in 1882, Rudolf Reicke began putting the manuscript together and, eventually, the entire manuscript was published in the late 1930s. The special nature and format of the text, as well as human failings, contributed to the long delay, but, happily, "more than 130 years after Kant's death, the text of his *Opus Postumum* was finally available for serious study" (*OP* xxiii).

Hall argues that, because there are strong parallels between the analogies of experience and the ether deduction, it is likely that the gap is located in the analogies of experience.[151] Hall points to Kant's concept of Substance as a precursor to ether and argues that the ether deduction is particularly anticipated in the third analogy's argument that empty space is not an object of possible experience. I agree with Hall's suggestion that the gap is likely located in the analogies. I will, therefore, discuss the similarities between the first and third analogies and the ether deduction. I will argue in this chapter that, whether or not the transition project is successful in its original purpose, Kant's ether proofs play another important role in his system of thought: expanding on the analogies of experience in the *Critique of Pure Reason*.

III. Ether

Like the analogies of experience, the ether deduction also concerns the need for an infinite continuum of matter. Guyer explains that, to Kant, matter, or the substance of

[151] Hall, *Post Critical Kant*, 94.

physical objects, consists "not of atoms but of differing degrees of attractive and repulsive forces at different regions of space."[152] Kant argues that we can only determine that existing physical objects are in different positions of empirically perceived space if we can posit dynamical interactions between physical objects which exist simultaneously. Therefore, Kant describes a material that is universally distributed and all-penetrating, within which all other moving forces are included. It is permanently moving by its own attraction and repulsion, and it is the origin of the movement of all materials. Kant calls this idea 'ether' or 'caloric,' describing it as a material which "lies at the basis of the possibility of the moving forces and their combination into one experience" (*OP* 21:229). The idea of ether is crucial in the idea of the unification of the moving forces of matter.

Similar to Substance from chapter one, we have no empirical cognition of the ether, which cannot be an object of perception. Nevertheless, according to Hall, "being affected by the ether in sensibility (subjective perception) is a necessary condition for the subject's empirical cognition of substances."[153] As Kant explains in the analogies and makes more clear in *MFNS* and *OP*, incapable of exerting force, empty space cannot affect the subject and is, therefore, not an object of possible perception or possible experience.[154] As Kant explains in the ether deduction, "emptiness in space or time is in no way an object of possible experience, since it is not an object of outer or inner sense" (*OP* 21:226). However, like in the third analogy, in the ether deduction Kant is careful to note that when he explains that empty space is not an object of experience, he is not

[152] Guyer, *Claims of Knowledge*, 228.
[153] Hall, *Post Critical Kant*, 112.
[154] Hall, "Reconstruction of Kant's Ether Deduction," 737.

saying that empty space is impossible. He is making an epistemological claim that empty space is not an object of possible experience for beings like us because we can only experience what we can perceive, and can only perceive what affects us.[155] As Frederick Beiser explains, perception of the existence of some body in space is only possible if one's body is part of a system of physical bodies in dynamic interaction, an idea which is "completed by ether proofs."[156] Beiser explains that, to Kant, "the ether is the substrate of all the moving forces of nature, the basis for their unity and interconnection."[157] As the substrate underlying all moving forces, Beiser calls ether the community of nature's objective basis, and "the *basis* or *matter* of all experience."[158]

Friedman adds that, before Kant developed his ether proofs of 1799, he had used ether as a hypothetical explanation of a variety of physical phenomena, such as light. By the time he was writing the ether proofs in 1799, however, Kant conceived of ether not as a physical hypothesis, but as "an a priori condition of the very possibility of outer objects of perception in the context of a unified experience."[159] According to Michael Friedman,

> the [ether] proofs of 1799 take up the empirical embodiment of the subject from a somewhat different angle by showing how the idea of a unified experience of outer objects in space . . . can lead to an a priori argument for the existence of a space-filling [ether] (something Kant had earlier viewed as a mere empirical hypothesis) as a necessary condition for fully embodied perception in the context

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[155] Hall, "Reconstruction of Kant's Ether Deduction," 737.
[156] Frederick C. Beiser, *The Fate of Reason: German Philosophy from Kant to Fichte* (Cambridge, Massachusetts: Harvard Unversity Press, 1987), 193.
[157] Frederick C. Beiser, *German Idealism: the Struggle against Subjectivism, 1781-1801* (Cambridge: Harvard University Press, 2002), 188.
[158] Beiser, *German Idealism*, 208.
[159] Michael Friedman, "Eckart Förster and Kant's *Opus Postumum*," *Inquiry* 46, no. 2 (2003): 221.

of a unified experience.[160]

As Friedman explains, Kant's object is to show that ether is a necessary condition of the possibility of experience, "but the notion of the possibility of experience is given a much stronger interpretation than it had in the critical period."[161]

What one calls the material that Kant calls ether does not matter. According to Hall, "when Kant affirms the actuality of the ether, he is neither simply affirming those conceptions of the ether popular in his day (light-ether/heat-ether), nor is he affirming the reality of the material Michelson and Morley failed to detect in the nineteenth century."[162] It is the many functions of the material that Kant is concerned with: ether must be a material that is "capable of moving collectively, expanding continuously, and constantly agitating."[163] Kant describes the ether in the following quotation:

> The basis of all possible perceptions of the moving forces of matter in space and time is the concept of an elementary material, distributed everywhere in cosmic space, attracting and repelling only in its own parts, and which is continuously internally self-moving. Its concept is made into the sole principle for the possibility of experience of an absolute whole of all internally moving forces of matter, and is known as such according to the rule of identity. This form of a universally distributed, all-penetrating world-material, which is in continuous motion in its own location, characterizes the originally moving matter as a real, existing material, according to the principle of the possibility of experience itself. It thereby furnishes objective reality to this concept. This *material* is thus not a merely *hypothetical* one, feigned so as to explain certain phenomena according to the laws of experience. (*OP* 21:225)

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[160] Michael Friedman, *Kant and the Exact Sciences* (Cambridge: Harvard University Press, 1992), 219
[161] Friedman, *Exact Sciences*, 300.
[162] Hall, "Dilemma," 101.
[163] Hall, "Dilemma," 101.

As this quotation makes clear, ether serves as the ultimate source of the perceptual affection from the physical bodies that affect the senses of receptive subjects. Hall focuses in on the idea that the dynamic forces of ether "must act as the qualitative ground for the relations of mechanical force between physical bodies."[164] As the ontological ground for physical bodies, the moving forces of matter are unified within the ether.

IV. Ether and Substance

In Kant's explanation for how the category of substance can apply to substances, the ether or the concept of Substance can be made possible as that which underlies substances. As shown in chapter one, Substance is not an immediate object of experience. However, as Hall writes, "it can still be a mediate object of experience where experience of this object is mediated by the immediate objects of experience, viz. the substances that are objects of empirical intuition."[165] In chapter one, I referred to a seeming paradox that Kant points out in the first analogy, where he writes that change concerns determinations which can cease or begin, and, almost paradoxically, only substance, or that which persists, can be altered. Hanna argues that Kant's ether deductions can be used to solve the problem of a seeming paradox that I examined in chapter one. Hanna explains that the ether deduction allows for a clearer distinction between primary and secondary substances, or substances and Substance, than could be found in the first analogy. He argues that the seeming paradox "withers away" if we understand that individual material

[164] Hall, "Dilemma," 101.
[165] Hall, "Dilemma," 107.

substances, the secondary substances, are nothing but positions in the ether, the primary substance.[166] Hanna explains that "there can be no change in any of the properties of the many individual material substances without a corresponding change in the properties of the One Big Substance."[167]

Accordingly, Hanna argues that Kant's "notion of a single unchanging sempiternal substratum is not in any way intended by him to exclude the possibility of a real plurality of temporarily existing empirical substances."[168] Hanna gives two reasons for this:

> first, the third analogy explicitly requires a real plurality of simultaneous causally-dynamically interacting individual substances. And, second, since the aether [sic] is nothing but a *complex totality* and *structure* of moving forces, then it follows that the many real individual substances are simply *positions* in that structure, or integral parts of that structure, and in this way they do not in any way compromise the unity or singularity of the aether [sic].[169]

Tying together the first and third analogy, empirical objects can be understood as positions in the ether, resulting from the interaction of the moving forces of matter. Empirical objects supervene upon the ether, but they are not reducible to the ether itself. Hanna continues, arguing that, in fact, the third analogy "requires a real plurality of simultaneous causally-dynamically interacting individual substances."[170]

Hall points out another important distinction made in Kant's writings: Kant distinguishes between 'direct appearance' and 'indirect appearance,' explaining that

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[166] Hanna, *Science and Human Nature*, 234.
[167] Hanna, *Science and Human Nature*, 395.
[168] Hanna, *Science and Human Nature*, 55.
[169] Hanna, *Science and Human Nature*, 55.
[170] Hanna, *Science and Human Nature*, 55.

direct appearances are given to a subject when the moving forces of matter affect the subject, and indirect appearances are produced by the subject.[171] As Hall explains, the ether appears to the subject *directly*, while objects of experience appear *indirectly* "and depend upon the activity of the subject organizing direct appearances."[172] To Kant, "experience does not come of its own accord as influence of the moving forces on sense, but must be made" (*OP* 22:321). From direct appearances, the subject makes indirect appearances, or objects of experience. Relating this to my first chapter, if direct appearances are of the ether or Substance, indirect appearances are of substances. Objects of experience, indirect appearances, or substances, are, in Hall's words, "what appears in empirical intuition after the subject has organized direct appearances."[173] Kant writes, "the perception of outer objects is nothing other than the act of the subject through which it affects itself and perceptions are nothing other than moving forces combined together with consciousness" (*OP* 22:392.3-6). For one to have objective perception of substances, Substance must *affect* the subject through its moving forces, or direct appearance. The subject then must combine direct appearances into spatially discrete substances, or indirect appearance.

The ether does not share any of the determinations of the empirical objects, even though it is the ether which makes the determinations possible. Empirical objects are constructed by the ether, but Hall reminds us that empirical objects "possess their own

[171] Hall, *Post Critical Kant*, 125-126.
[172] Hall, *Post Critical Kant*, 113.
[173] Hall, *Post Critical Kant*, 125-126.

principles of unity distinct from the plenum of forces upon which they supervene."[174] The relationship between empirical objects and the ether is not a part-whole relationship: while empirical objects emerge from the ether, the objects are not reducible to the ether.[175]

Kant does not intend for the notion of a single unchanging sempiternal substratum to exclude the possibility of the existence of a plurality of individual substances. Since the ether is a totality and structure of the moving forces, the individual substances are positions in that structure but do not compromise the ether's unity or singularity.[176] As Kant explains, "the proposition that there are empirical bodies presupposes the proposition that there is matter whose moving forces and motion precedes the generation of a body" (*OP* 21:216-217). Through the introduction of the ether, Kant is able to have both relatively enduring empirical substances persisting through their alterations and standing in causal relations with each other, as well as one sempiternal and omnipresent Substance which ensures that nothing arises or perishes absolutely, as that would violate the necessary conditions of possible experience.

V. Ether and Interaction

As seen in chapter two's discussion concerning the third analogy, our experience requires simultaneous causally interacting individual substances. At the same time, a

[174] Hall, "Dilemma," 106.
[175] Hall, *Post Critical Kant*, 83.
[176] Hanna, *Science and Human Nature*, 55.

continuous field of interacting forces of matter is necessary for spatial experience to be unified and, therefore, to be possible. To Kant, all substances or states of substances that we perceive to be simultaneous are in relations of thoroughgoing interaction. If separated by empty space, substances could not causally interact and, therefore could not stand in the causal community required by the third analogy. To Kant, "there can be no experience of empty space, therefore no inference to the object thereof. In order to be instructed of the existence of a matter I need the influence of a matter on my senses. The proposition that there are empty spaces can therefore be neither a mediate nor an immediate empirical proposition" (*OP* 21:216-217). The ether deduction builds on Kant's arguments about perceptions being the effects of the moving forces upon us, with the ether as the plenum of moving forces. Kant's concept of the whole of outer space presupposes that there is a collective unity of all the possible moving forces of matter in filled space. As Kant explains, "the basis of the whole of the unification of all moving forces of matter is the ether" (*OP* 21:224.3-16).

Since Kant explains that empty space cannot be an object of possible experience, the concept of the whole of outer experience presupposes the continual movement of matter acting upon the subject exciting the senses. We have perceptions of outer objects because of the effects of the moving forces upon us. As Kant writes,

> **there exists** outer experience as a collective whole of all perceptions: that is, as *one* all-embracing possible experience. There exists outside us a sense-object, for whose *perception* externally moving forces of matter are required; the empirical representation of these forces, combined in a subject, is the *basis* of all the appearances which together form the unity of experience. (*OP* 21:582-83)

To Kant, experience is knowledge by means of connected perceptions and ether is the

basis for combining the moving forces which act upon us into a single all-embracing whole and from which the systematic unity of experience is derived.

According to Guyer, to argue that ether ensures that perceptions can be transmitted to the subject from any region of space, "Kant's argument starts with the premise that the perception of any object always requires the transmission of motion from that object to the sensory organs of the perceiving subject."[177] Kant argues that our ability to perceive objects at any point in space relies on the ether, or any medium capable of transmitting the effects of the moving forces to us from any point in space. According to Guyer, the argument that the transmission of forces through the ether is necessary for our perception "assumes that the causation of perception must be understood in the same terms as are available for any other causal connections."[178] This argument also assumes

> either that perception of an object at any point in space is possible, and thus that a cause of perception is located at every point in space, or else that even if not every point in space *contains* a perceivable object that there is no point in space *from* which some object cannot be perceived, thus that there must be a medium for the transmission of perception to and through every point in space.[179]

Thus, as Guyer explains, Kant presupposes that physical action at a distance, including the action necessary for perception of distant objects, is impossible without some physical medium.[180] Things in space and time can only be perceived if some force is transmitted from the object of perception to the subject who perceives the object. According to Guyer, since we can perceive objects at any point in space and time, "there

[177] Guyer, *Kant's System of Nature and Freedom*, 81-82.
[178] Guyer, *Kant's System of Nature and Freedom*, 82.
[179] Guyer, *Kant's System of Nature and Freedom*, 82.
[180] Guyer, *Kant's System of Nature and Freedom*, 82.

must be some medium for the transmission of such force throughout all of space and time."[181]

Hall points out that in ordinary experience, space does not seem to be filled up with substances.[182] He also explains, however, that the lack of perceivable objects between the Earth and the Moon does not mean that the space is empty.[183] Hall explains that "the ether or 'Substance' rules out the experience of *empty* space by occupying space through its moving forces even if the space that is occupied does not contain a perceivable object or 'substance.'"[184] Hall argues that even regions of space too remote for us to perceive substances are still connected with perception by the moving forces of matter. As Hall puts it, "the moving forces of the ether *preclude* the experience of empty space even if they do not *include* the experience of any particular substance."[185] That the ether's moving forces are omnipresent guarantees that we are connected to all substances at all points in space and can perceive distant objects as far away from us as other planets and stars.

Returning to the example of our perception of the Earth and the Moon in chapter two, Kant's writings on ether in the *Geography* and *Opus Postumum* can clarify the distinction between weak and strong interaction. In the last chapter, I used the example of our relation to the light between distant objects, such as heavenly bodies creating a mediate community. In the *Geography*, Kant suggests that, apart from gravitation, light is

[181] Guyer, *Kant's System of Nature and Freedom*, 76.
[182] Hall, *Post Critical Kant*, 102.
[183] Hall, *Post Critical Kant*, 102.
[184] Hall, *Post Critical Kant*, 102.
[185] Hall, *Post Critical Kant*, 102.

the only foreign force that can be felt on the Earth. Similarly, in *Opus Postumum*, Kant also suggests that light is "only a vibrating motion of the aether [sic], just as sound originates in a trembling motion of the air" (*PG* 9:220). While Kant remains clear that he is not referring to a theory of light-ether, he does compare ether to a "light-matter which occupies the space between the eye and the object" (*OP* 21:229). Kant explains that ether is spread throughout the universe and allows us to "perceive objects in space at all distances" (*OP* 22:84). Thus, functioning as the vehicle of light propagation, the ether allows our perceptual contact with heavenly bodies.

To Kant, our observations of the relations between heavenly bodies is only possible because of the propagation of light in the ether. Kant explains in *Opus Postumum* that light and sound are external forces whose modifications like colour and tones make space sensible. According to Kant, light and sound, which are the mediums by which we perceive action at a distance, are mediate perceptions. He uses heat as an example of an immediate perception: "the medium by which we perceive things as external to us at a distance, is *light* and *sound*. They are mediate perceptions. Heat is an immediate one" (*OP* 22:434). Therefore, Guyer argues that, similar to how we learn about objects in our immediate terrestrial environment by handling objects and becoming acquainted with their temperatures and weights, we learn about distant objects in the cosmic system by watching the motions of the heavenly bodies in relation to us and other heavenly bodies, inferring their masses by laws such as the law of universal gravitation.[186] Friedman adds that, without the propagation of light in the all-pervasive

[186] Friedman, *Construction of Nature*, 199.

ether, we could not attain perceptual contact and determine the shapes, sizes, spatial positions and motions of the heavenly bodies.[187] He suggests that perceptual contact with distant objects is mediated by the ether as the light vibrations communicate with our eyes in the same way that "more immediate perceptual contact with these bodies in our terrestrial environment is effected through the sense of touch."[188]

As shown above, in the first *Critique*, perception was appearance combined with consciousness. In the ether proofs, Kant's updated definition involves moving forces affecting the subject. Presupposing ether as a universally distributed, all penetrating world-material of moving forces allows Kant to show how space becomes an object of possible experience, and how one can have outer experience at all.[189] As Hall puts it, "outer experience in Kant's sense requires that actual objects affect receptive subjects in sensibility."[190] With Kant's updated definition of perception and his claims about ether's role as a medium of our experience of distant objects, the difference between weak and strong interaction breaks down. The ether is a medium through which both immediate and mediate thoroughgoing interaction takes place.

VI. Ether as *A Priori*

Something similar to ether is anticipated by Kant's arguments about Substance in

[187] Friedman, *Construction of Nature*, 198-199.
[188] Friedman, *Construction of Nature*, 199.
[189] See *OP* 21:229.
[190] Hall, *Post Critical Kant*, 115.

the analogies, but ether cannot be established by the arguments in the analogies.[191] Like space or Substance, ether also cannot be perceived except through its relatively persisting determinations; since the ether itself cannot be an object of perception, we have no empirical cognition of the ether. As Beiser writes, ether "cannot be found within experience because its existence cannot be confirmed by perception."[192] Nevertheless, according to Hall, "being affected by the ether in sensibility (subjective perception) is a necessary condition for the subject's empirical cognition of substances."[193] Beth Lord explains that, while the ether is a necessary concept for experience and is constitutive of experience, it "cannot be demonstrated from or in experience, since it affects the senses beneath the threshold of apperception and recognition."[194] As Kant puts it, "it is not an object of the senses, but rather of sensibility" (*OP* 21:550, p. 80). As Eckart Förster asserts, even though the ether cannot be given in experience, "it must not be regarded as a fantasy, or as a figment of the imagination."[195]

According to Beiser, ether is usually thought of as a "quaint relic of bygone physics,"[196] but "the chief role of the ether is not physical or scientific for Kant."[197] As Friedman explains, because ether cannot achieve a necessary and non-hypothetical status from mere physical or empirical theorizing, the idea of ether must contain some kind of

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[191] Hall, "Dilemma," 104.
[192] Beiser, *German Idealism*, 208.
[193] Hall, *Post Critical Kant*, 112.
[194] Lord, *Kant and Spinozism Transcendental Idealism and Immanence from Jacobi to Deleuze* (Basingstoke: Palgrave Macmillan, 2011), 165.
[195] Eckart Förster, *Kant's Final Synthesis: An Essay on the Opus Postumum* (Cambridge: Harvard University Press, 2000). 92.
[196] Beiser, *German Idealism*, 188.
[197] Beiser, *German Idealism*, 188.

transcendental content if it is to be connected with the conditions of the possibility of experience.[198] Otherwise, ether could only be used as a hypothesis in explanations of particular empirical phenomena. Furthermore, explains Friedman, by Kant's development of the ether proofs in 1799, ether has entirely lost its merely hypothetical status, becoming "an a priori condition of the very possibility of outer objects of perception in the context of a unified experience."[199]

At the same time, Beiser argues that attempting to prove the ether entirely *a priori* contrasts with the critical philosophy because, as Kant admits, not being able to derive the existence of objects from concepts alone is a central doctrine of the *Critique of Pure Reason.*[200] As Kant explains in *Opus Postumum*,

> if it can be proved that the unity of the *whole* of possible experience rests upon the existence of such a material (with its stated properties), then its actuality is also proved, not, indeed, **through** experience, but *a priori*, merely from the conditions of *possibility*, for the sake of the possibility of experience. For the moving forces of matter can only come together into a *collectively universal* unity of perceptions in a possible experience insofar as the subject, [affected] by them, unites them externally and internally in one concept, [and] affects itself by means of its perceptions. Now the concept of the whole of outer experience also presupposes all possible moving forces of matter as combined in collective unity; to wit, in full space (for empty space, be it space enclosed within bodies or surrounding them externally, is not an object of possible experience). It further presupposes the *subject*, as an object of sense, is affected. For without this motion, that is, without the stimulation of the sense organs, which is its effect, no perception of any object of the senses, and hence no experience, takes place – the latter containing only the form belonging to the perception. Hence there exists as an object of experience in space (although without empirical consciousness of its principle) a particular

[198] Friedman, *Exact Sciences*, 297.
[199] Friedman, "Eckart Förster," 221.
[200] Beiser, *German Idealism*, 188.

> material which is continuously and boundlessly distributed and constantly self-agitating. That is, caloric is *actual*; it is not a material feigned for the sake of the explanation of certain phenomena, but rather a material demonstrable from a universal principle of identity (analytically) and which is given *a* priori in the concepts themselves (*OP* 22:50-51).

In the quotation above, Kant is clear that ether is not proven by experience, but *a priori.* However, the ether is unusual as an *a priori* condition of possible experience because the ether must also affect the senses of the subject, though without the subject's empirical consciousness.

Accordingly, Beiser points out that, even according to Kant, the ether proofs are "strange"[201] because they "they demonstrate the *existence* of an object as a necessary condition of experience. They do not attempt to prove its existence from experience but *a priori*, through reasoning from a priori concepts and the law of identity alone."[202] Furthermore, Lord states that "what is really strange, however, is that Kant finds a transcendental condition of the possibility of experience in the existence of a self-active, self-subsistent, all-pervasive and dynamical material that gives intuitions their content."[203] As Lord explains, it seems as if "experience is both transcendentally conditioned and materially generated by the same thing."[204]

Guyer suggests that we should not be hasty to conclude that the ether is too empirical to be the condition of the possibility of experience. He reminds us that "the

[201] Beiser, *German Idealism*, 188.
[202] Beiser, *German Idealism*, 188.
[203] Lord, *Kant and Spinozism*, 165.
[204] Lord, *Kant and Spinozism*, 165.

concept of the ether is not an ordinary empirical concept."[205] Guyer goes on to say, however, that the ether cannot be regarded as a mere concept of experience, or as a merely empirical hypothesis: "while the premises of Kant's ether deduction certainly go beyond the pure concept of experience, it would be equally misleading to think of them as mere empirical hypotheses."[206] He explains that the ether proofs combine "the empirical and the transcendental in a more complicated way than that."[207] Guyer suggests that the ether deduction might be evidence that, to Kant, "there is no completely hard-and-fast line between pure and empirical characterizations of experience."[208] Guyer argues that the ether deduction should be understood as "straddling the ordinary boundary between merely empirical and the purely conceptual."[209] Therefore, as Guyer explains, the ether deduction "should count as a transcendental deduction with a premise that is neither simply empirical nor purely conceptual."[210] Guyer concludes that Kant "is not attempting to deduce the existence of the ether from anything he regards as simply an empirical observation about our perception of space, nor from a pure concept of experience, but from a synthetic *a priori* premise about the nature of space."[211]

Beiser agrees with Guyer that "the ether does not readily or easily follow Kant's normal distinction between the formal and the material, or the transcendental and empirical."[212] According to Beiser, the concept of the ether "has a unique status because

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[205] Guyer, *Kant's System of Nature and Freedom*, 76.
[206] Guyer, *Kant's System of Nature and Freedom*, 76.
[207] Guyer, *Kant's System of Nature and Freedom*, 85.
[208] Guyer, *Kant's System of Nature and Freedom*, 76.
[209] Guyer, *Kant's System of Nature and Freedom*, 85.
[210] Guyer, *Kant's System of Nature and Freedom*, 81.
[211] Guyer, *Kant's System of Nature and Freedom*, 81.
[212] Beiser, *German Idealism*, 208.

it has objective reality and yet also serves as a necessary condition of experience."[213] Hall also agrees, adding that "since the ether is actual only relative to the *conditions of possible experience*, it is transcendentally ideal. Since the ether is *actual*, according to these conditions, it is likewise empirically real."[214]

Hall suggests that Kant's ether deduction both fails and succeeds. I agree with Hall's claim, which states that

> one cannot evaluate the ether deduction simply on the basis of what Kant may have intended, but one must also take into account what Kant does in fact *achieve*. Insofar as Kant is able to establish the existence of the ether as the *material* transcendental condition of experience and derive a new *a priori* concept of the ether or Substance, the ether deduction should be considered a major post-Critical development of Kant's Critical Philosophy.[215]

While it is unclear whether the ether deduction achieves its original intention of bridging the gap between the metaphysical foundations of natural science and physics, Kant's ether does clarify his writings on substance and interaction in the analogies of experience. I agree with Hall that Kant's ether deduction is successful both in proving the actuality of the ether as a material transcendental condition for experience, and in enhancing Kant's arguments in the analogies.

VII. Conclusion of Chapter Three

As I have shown in this chapter, Kant's ether deduction expands on his

[213] Beiser, *German Idealism*, 207-208.
[214] Hall, *Post Critical Kant*, 115.
[215] Hall, *Post Critical Kant*, 117.

conceptions of substance, succession, and community in the *Critique of Pure Reason*. By updating 'substance' to now include a system of moving forces of matter, Kant's conception of ether becomes the all-encompassing material field of activity which allows for our perception of physical things. Kant's ether cannot be proven by the argument of the analogies because it requires an *a priori* argument that cannot be found in Kant's conception of substance. However, the ether is anticipated by the analogies and I believe that an examination of the ether as a necessary condition of possible experience is required for a full understanding of Kant's arguments in the analogies. The ether can follow the doctrines of the first *Critique* as long as we remember that the subject of outer experience – what Friedman calls "the perceiver of outer objects in space"[216] – is embodied in space and subject to the moving forces of matter which bring about the perceptions of substances and their interaction.

[216] Friedman, "Eckart Förster," 218.

CONCLUSION

As I showed in chapter three, an examination of Kant's ether deduction in *Opus Postumum* can influence our understanding of substance and interaction in the analogies of experience. Although it has been ignored or dismissed by many scholars, I believe that the *Opus Postumum* is a useful addition to Kant's metaphysical and scientific works. Furthermore, I have made it clear that I do not believe that the ether deduction is a departure from Kant's metaphysical writings in the *Critique of Pure Reason*. I have argued that a precursor of Kant's ether is found in the analogies, where Kant is clear that empty space is not an object of possible experience.[217] As Kant writes in *Opus Postumum*, "the whole of cosmic space as an object of possible experience is not empty in any of its parts, but is a full space, for empty space is not an object of possible experience" (*OP* 21:228). Similar to Substance, ether is necessary for the spatiotemporal unity of possible experience.

As shown in chapter one, we must remember that when Kant uses the word "change" he means that a determination, state, or particular way for a substance to exist is arising or perishing. Moreover, like the changes in the states of objects, the arising and perishing of objects themselves must also be conceived as alterations, "i.e., as changes in the determinations or states of what is, so to speak, really permanent."[218] To Kant, it would not be possible to have a unity of experience if new substances could arise or perish from or into nothing.

[217] Hall, "Dilemma," 102.
[218] Rosenberg, "Identity and Substance," 143.

As I also explained in chapter one, 'substance' to Kant can be interpreted in two different ways. It can refer to individual substances that persist relatively, or it can refer to an omnipresent Substance that persists absolutely. Using Bryan Hall's terms, I argued in chapter one that relatively enduring empirical objects which persist through the alterations of their properties, as seen when a leaf changes colour, are substances, and Substance refers to a "one sempiternal and omnipresent Substance whose quantum in nature is neither increased nor diminished."[219]

What we perceive as change is the alteration of the accidents, or extrinsic properties, instantiated in the material substrate.[220] The particular material bodies, substances coming into being and passing out of being, are parts of Substance.[221] Kant's notion of Substance or ether as a single unchanging sempiternal substratum does not exclude a real plurality of individual substances.[222] We individuate substances and experience their alterations, while the concept of Substance or ether ensures that there is a common spatiotemporal framework in which the substances we experience take place.[223] Empirical objects supervene upon the ether, but they are not reducible to the ether itself.

I have shown that determining the place of a substance in time is to determine the states of Substance in time. When determining substances' places in space and time, we do not determine simply that Substance exists at a certain place and time, but that

[219] Hall, "Dilemma," 80.
[220] Hanna, *Science and Human Nature*, 394.
[221] Hanna, *Science and Human Nature*, 394.
[222] Hanna, *Science and Human Nature*, 55.
[223] Hall, "Dilemma," 107.

Substance in certain *states* exists at a certain place and time.[224] Particular objects, like tables or leaves, can be understood as states of the all-embracing substance, known in *Opus Postumum* as 'ether.' While individual substances are positions or parts of the totality and structure of ether, they do not compromise the ether's unity or singularity.[225] The distinction between the two concepts of substance and the introduction of the ether allow Kant to have relatively enduring substances standing in causal relations with each other, as well as one omnipresent Substance which ensures that nothing arises or perishes absolutely.

Furthermore, if we apply the concept of ether to our experiences of succession and simultaneity, the experiences can be unified within a single spatiotemporal backdrop. As I explained in chapter two, when Kant addresses the problem of substantial interaction in the third analogy, he argues that we must presuppose community between all simultaneous substances. Kant describes a situation of thoroughgoing mutual interaction throughout the entire cosmos, namely, the interaction between the Earth and the other heavenly bodies. If there is substance everywhere, as Kant argues, the Earth and the Moon share the same spatial framework and there is a backdrop for causal community. It is through this interaction that our own relative position and motion on the Earth and within the cosmos is determined.

Like substance in chapter one, I showed that thoroughgoing interaction in chapter two can also be interpreted in two different ways. In chapter two's discussion of weak

[224] Watkins, *Metaphysics of Causality*, 222.
[225] Hanna, *Science and Human Nature*, 55.

and strong thoroughgoing interaction, I showed the importance of distinguishing between mediate and immediate community. While perception of the intermediary light between celestial bodies does not cause determinations in other objects the way a strong interpretation requires, with the development of the ether, Kant makes it clear that both the light we perceive, and forces of attraction and repulsion involve the vibration of the ether. Both weak and strong interpretations of thoroughgoing interaction are compatible with the ether deduction.

It is not difficult to imagine regions of space without perceivable substances. Nonetheless, to Kant, the moving forces ensure that all substances, no matter how remote, would still be connected. As I explained in chapter two and expanded upon in chapter three, an object that counts as a perception must arise in one's consciousness because of the influence of the object on one's senses. All one's perceptions of outer objects are the effect of a moving force of matter on oneself,[226] and experience is knowledge through connected perceptions. Kant's concept of ether or caloric helps makes space sensible, since it allows Kant to argue that space is filled with moving forces.[227]

In chapter three, I examined Kant's claim that the existence of space filling ether is a condition of the possibility of experience, specifically "of the possibility of the experience of external objects existing outside us in space."[228] Like space or Substance, though, ether also cannot be perceived except through its relatively persisting determinations. Therefore, ether is not proven by experience, but "should be considered a

[226] Förster, *Kant's Final Synthesis*, 87.
[227] See *OP* 21:233.
[228] Friedman, *Exact Sciences*, 217.

transcendental material condition for experience."[229]

Thus the Ether Deduction is helpful in clarifying the confusion about what substance and interaction mean to Kant and constitutes an important contribution to the work of the Analogies. Kant's Ether is similar to Substance in the First Analogy thus allowing for the thoroughgoing interaction required in the Third Analogy; given this relationship to the Analogies, the ether deduction in *Opus Postumum* should not be considered a departure from the metaphysical system of the *Critique*.[230] Although the arguments of the Analogies are insufficient to prove the existence of the ether, Kant's explanations of substance and interaction both require and anticipate his later development of the ether as the structure of the totality of nature's moving forces of matter.

[229] Hall, "Dilemma," 102.

[230] As suggested by one of the examiners of this thesis, a topic for further discussion concerns the possibility that the relation between the analogies and the ether may move Kant toward a metaphysical realism, transcendental realism, or German idealism. While beyond the scope of this thesis, the question remains crucial for future examination of the *Opus Postumum* and its relation to Kant's other works.

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