

THE THEORY OF INTENSIVE MAGNITUDES IN LEIBNIZ AND KANT

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A DISSERTATION

PRESENTED TO THE FACULTY

OF PRINCETON UNIVERSITY

IN CANDIDACY FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

RECOMMENDED FOR ACCEPTANCE

BY THE DEPARTMENT OF

COMPARATIVE LITERATURE

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April 2012

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Abstract

This dissertation demonstrates the fundamental importance of the problem of intensive magnitudes for Leibniz and Kant. While their work has generated an immense scholarly literature, the systematic role of the concept of intensive magnitude has been neglected. I argue that attending to the problem of degree-valued properties reveals new connections among Leibniz's and Kant's metaphysical, epistemological, and aesthetic concerns. I show that they struggle to provide a unified theory of degree-valued properties, drawing on many aspects of their theoretical and practical philosophies. The problem of intensive magnitudes provides a new perspective on the relationship between Leibniz and Kant that reduces it neither to simple continuity nor to discontinuity. In addition, tracing the development of theories of intensive magnitudes shows that standard accounts of the rise of aesthetics in the eighteenth century miss the links between questions of taste and feeling and broader epistemological and metaphysical concerns; these accounts thus fail to appreciate the specific importance of eighteenth-century aesthetic theory for philosophy as a whole.

In an introductory chapter, I show that Leibniz's theory of intensive magnitudes draws on two distinct sources: the discussion of the *je ne sais quoi* in the seventeenth century and the long tradition of reflection concerning the problem of the intensification and remission of forms. The first chapter argues that Leibniz provides a new account of the individuation of substances on the basis of their intensive magnitudes. In the second I turn to a consideration of Leibniz's law of continuity—the principle that nature never

makes leaps—and demonstrate the way in which this principle grounds Leibniz’s theory of *petites perceptions* and the *je ne sais quoi*. Chapter 3 reconstructs Kant’s argument in the *Critique of Pure Reason* for the a priori principle that the “real” corresponding to sensation has an intensive magnitude. The concluding chapter considers whether representations contained in a single instant are simple and argues that, according to Kant’s account in the *Analytic of the Sublime*, the instant is not a constituent of objective cognition but arises from the *feeling* of limitation.

Acknowledgments

I have been fortunate to have benefited from the support, intellectual generosity, and erudition of my advisor, Daniel Heller-Roazen. Werner Hamacher's writing and teaching have been crucial to my thinking over the years. I would also like to thank Des Hogan and Daniel Garber for reading chapters of the dissertation and for their helpful comments.

Arnd Wedemeyer's critical acumen and dedication have shaped this project from beginning to end. To Beau Madison Mount, I owe a debt beyond all measure: both his philosophical rigor and editorial patience and care have been invaluable. Matthew Moss, Béatrice Longuenesse, Nick Stang, Lucy Allais, and Colin McLear have all provided useful comments and criticism on portions of this work. Anna Glazova, Lisa Cerami, and Sarah Pourciau have enriched this dissertation in various ways. My father, Carl Diehl and my mother, Joanne Feit Diehl, have supported me in every manner possible throughout my time in graduate school. In addition, I would like to thank my mother for her sharp proofreading eye.

I am grateful to Tobias Rosefeldt and the members of the colloquia at the Humboldt University in Berlin and at the Johann-Wolfgang-Goethe-Universität in Frankfurt for giving me the opportunity to present portions of this work and for the comments I received. I would also like to thank the Fulbright program and the Institute for Cultural Inquiry for financial support.

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Abbreviations

— Texts by Descartes

AT: *Œuvres complètes*, ed. Charles Adam and Paul Tannery, 11 vols. (Paris: Vrin, 1996)

CSM: *Philosophical Writings of Descartes*, ed. John Cottingham et al., 3 vols. (Cambridge: Cambridge University Press, 1984–91)

— Texts by Leibniz

AA: *Sämtliche Schriften und Briefe*, ed. Deutsche Akademie der Wissenschaften (Darmstadt and Berlin: Akademie-Verlag, 1923–); cited by series, volume, and page

AG: *Philosophical Essays*, ed. Roger Ariew and Daniel Garber (Indianapolis, Ind.: Hackett, 1989)

Child: *Early Mathematical Manuscripts of Leibniz*, ed. and trans. J.M. Child (Mineola, N.Y.: Dover, 2005)

CP: *Confessio philosophi: Papers Concerning the Problem of Evil, 1671–1678*, ed. R.C. Sleigh (New Haven: Yale University Press, 2005)

E: *God. Guil. Leibnitii opera philosophica*, ed. J.E. Erdmann, 2 vols. (Berlin: Eichler, 1840)

GP: *Die philosophische Schriften von Gottfried Wilhelm Leibniz*, ed. C.I. Gerhardt, 7 vols. (Berlin: Weidmann, 1875–90; rpt. Hildesheim: Olms, 1960)

Guh: *Leibnitz's Deutsche Schriften*, ed. G.E. Guhrauer, 2 vols. (Berlin: Veit, 1838–40)

GM: *Leibnizens mathematische Schriften*, ed. C.I. Gerhardt, 7 vols. (Berlin: Weidmann, 1849–63, rpt. Hildesheim: Olms, 1966)

Grua: *Textes inédits d'après les manuscrits de la Bibliothèque provinciale de Hanovre*, ed. Gaston Grua, 2 vols. (Paris: PUF, 1948)

HO: *Historia et origo calculi differentialis*, ed. C.I. Gerhart (Hanover: Verlag der Hahn'schen Hofbuchhandlung, 1846)

LLC: *The Labyrinth of the Continuum: Writings on the Continuum Problem, 1672–1686*, ed. Richard A. Arthur (New Haven: Yale University Press, 2001)

LDB: *The Leibniz–Des Bosses Correspondence*, ed. Brandon Look (New Haven: Yale University Press, 2007)

KS: *Kleine Schriften*, ed. Hanz Heinz Holz (Frankfurt am Main: Insel, 1965)

L: *Philosophical Papers and Letters*, ed. and trans. Leroy E. Loemker, 2nd edn. (Dordrecht: Kluwer, 1969)

NE: *New Essays on Human Understanding*, ed. and trans. Peter Remnant and Jonathan Bennett (Cambridge: Cambridge University Press, 1996)

T: *Theodicy*, ed. Austin Farrer, trans. E.M. Huggard (Chicago: Open Court, 1990)

— **Texts by Kant**

Ak.: *Kants Gesammelte Schriften*, ed. Königliche Preußische (later Deutsche) Akademie der Wissenschaften zu Berlin (Berlin: de Gruyter, 1902–)

A/B: first (1781) and second (1787) editions of the *Kritik der reinen Vernunft*, respectively

KrV: *Kritik der reinen Vernunft*, ed. Jens Timmerman (Hamburg: Felix Meiner Verlag, 1998)

KdU: *Kritik der Urteilskraft*, Ak. 5:165–486

Classical and medieval texts follow standard citation conventions. Unless otherwise noted, translations from Aristotle are taken from *Complete Works: The Revised Oxford Translation*, ed. Jonathan Barnes, 2 vols. (Princeton: Princeton University Press, 1984). In the absence of specific reference to the contrary, English translations are the author's, except for Kant's Latin works, where the translations used are those of *Theoretical Philosophy, 1755–1770*, trans. David Walford and Ralf Meerbote (Cambridge: Cambridge University Press, 1992), which include Akademie edition pagination in the margin. Spellings in the German texts of the first and the third *Critiques* have been silently modernized.

Introduction:

From the *Je-ne-sais-quoi* to Intensive Magnitude in Leibniz and Kant

The pain I feel now may be stronger or weaker than the pain I will feel later. I may be in more or less pain than you are now. The light of the sun in the morning may be brighter or dimmer than the light in the afternoon. The warmth of the new wool coat may be greater or lesser than that of the old coat. Pain, brightness, and warmth are properties that come in degrees: they possess intensive magnitudes. Several aspects of degree-valued-properties are uniquely difficult to explain: Are qualities composed of distinct parts? Does a quality become more or less intense by the addition or subtraction of these parts? If so, what accounts for the apparent simplicity of a quality at a particular time? If not, how is it possible for one instantiation of a quality to be more or less intense than another instantiation of the same quality? This study reconstructs Leibniz's and Kant's theories of intensive magnitude, arguing that the concept of intensive magnitude plays a hitherto unappreciated, systematic role in their work.¹ Examining these theories sheds new light on important aspects of their theoretical philosophies, as well as suggesting a more complex interplay among their metaphysical, epistemological, and aesthetic concerns than has usually been recognized. In this Introduction, I consider the starting point for Leibniz's theory of intensity. His theory draws on two distinct sources: the discussion of

¹ In his recent survey of theories of intensity in the eighteenth century, *Die Entdeckung der Intensität: Geschichte einer Denkfigur im 18. Jahrhundert* (Göttingen: Wallstein, 2004), Erich Kleinschmidt mentions Leibniz in passing and devotes several pages to Kant's account of intensive magnitude. He provides, however, no systematic reconstruction of the role of this concept in their philosophical theories. Kleinschmidt focuses instead on documenting the variety of contexts in which the term "intensity" is used in the eighteenth century, concentrating in particular on its importance in the development of the natural science.

the *je ne sais quoi* in the late seventeenth century and the long tradition of reflection concerning the problem of the intensification and remission of forms.

1. The *Je ne sais quoi*

The phrase “*je ne sais quoi*” designates an object or a property—whether of theological, psychological, or aesthetic kind—as something that exceeds the speaker’s knowledge of that in which it consists. To classify something as being or having a *je ne sais quoi* is to say that it falls outside the boundaries of epistemic access—to label it as belonging to a sphere beyond that to which the *I*’s cognitive determinations extends. It is not obvious whether the “*je*” loses its usual source of reference by being embedded in a fixed phrase: while the *je* who does not know might seem to be the very one who is speaking, the fact that the form of the phrase does not change across speakers when the construction is embedded in a “that”-clause suggests that the “*je*” loses its indexicality. This phrase draws on a long history of nominalizing clauses that proclaim first-person ignorance, dating back at least to Cicero’s *nescio quid*.² The *je ne sais quoi* frequently signifies not only that the speaker does not know what the thing referred to is, but that one *cannot* know what it is—that it is ineffable. Vladimir Jankélévitch, for instance, considers the *je ne sais quoi* to be the phenomenon of indemonstrability itself, at once the most evident thing and the thing that cannot be said. The *je ne sais quoi*, he writes, is “la mauvaise conscience de la bonne

² For a history of the *je ne sais quoi* to which the brief discussion here is indebted, see Richard Scholar, *The Je-Ne-Sais-Quoi in Early Modern Europe: Encounters with a Certain Something* (Oxford: Oxford University Press, 2005) and Erich Köhler, “‘*Je ne sais quoi*’: Ein Kapitel aus der Begriffsgeschichte des Unbegreiflichen,” in his *Esprit und arkadische Freiheit: Aufsätze aus der Welt der Romanie* (Munich: Wilhelm Fink, 1984), 230–286.

conscience rationaliste.”³ Jankelevitch’s use of the phrase intensifies it in two ways. First, no one can know what this something is: it shifts from what is actually unknown by a particular speaker to what it is impossible for anyone to know. Second, the phrase designates the property of ineffability. In this sense, it stands for being-unknowable. Not only can we say that someone or something has a *je ne sais quoi*; we can also say that the *je ne sais quoi* is the *absconditum* itself. Yet despite this quick progression from subjective ignorance, to unknowability, to the phenomenon of ineffability as such, the “*je*” in *je ne sais quoi* nevertheless retains a semantic tie to the first-person pronoun.

In the Duc de Luynes’s 1647 French translation of the *Meditationes de prima philosophia*—supervised by Descartes himself—an adjectival form of the *je ne sais quoi* appears at the moment in the argument in which the narrator distinguishes what is certain in the *moi* beyond all delusions of the imagination:

Mais ie ne me puis empescher de croire que les choses corporelles, dont les images se forment par ma pensée, & qui tombent sous les sens, ne soient plus distinctement connuës que cette ie ne sçay quelle partie de moy-mesme qui ne tombe point sous l’imagination: quoy qu’en effet ce soit vne chose bien étrange, que des choses que ie trouue douteuses & éloignées, soient lus clairement & plus facilement connuës de moy, que celles qui sont véritables & certaines, & qui appartiennent à ma propre nature. (AT 9:23)⁴

This *je ne sais quoi* is connected to the self in two ways: it stands for that *in me* that I know in this manner as well as for the manner in which *I*—and only *I*—can know it. It is what I know most certainly within me, although both this sort of knowledge and the thing known through it have been obscured by the imagination. It is the certain, undeniable aspect of me that must be uncovered through the work of meditation. In this sense,

³ Vladimir Jankélévitch, *Le Je-ne-sais-quoi et le Presque-rien I: La manière et l’occasion* (Paris: Éditions du Seuil, 1980), 11.

⁴ This text is mentioned in Köhler, “*Je ne sais quoi*,” 252.

Descartes might be seen as reaching back to Augustine's use of the *nescio quid* to designate the mystery of God's grace, but Descartes's use makes the "je" refer to a property of the cognizing subject itself and to a mode of this knowing. Descartes's *je ne sais quoi* intensifies the subjectivity that is in any case present when the *quoi* is something outside the cognizing self.

In the last half of the seventeenth century in France, the *je ne sais quoi* became an object of polemical controversy. François Fénelon, for instance, rhetorically adopts Descartes's characterization of a certain something in the self to persuade the reader of the ineffability of the self. Fénelon writes in the form of an address to God, but his target is clearly Descartes:

Je ne suis pas, ô mon Dieu! ce qui est: hélas! je suis presque ce qui n'est pas. Je me vois comme un milieu incompréhensible entre le néant et l'être: je suis celui qui a été; je suis celui qui sera; je suis celui qui n'est plus ce qu'il a été; je suis celui qui n'est pas encore ce qu'il sera: et dans cet entre-deux que suis-je? un je ne sais quoi qui ne peut s'arrêter en soi, qui n'a aucune consistance, qui s'écoule rapidement comme l'eau; un je ne sais quoi que je ne puis saisir, qui s'enfuit de mes propres mains, qui n'est plus dès que je veux le saisir ou l'apercevoir; un je ne sais quoi qui finit dans l'instant même où il commence; en sorte que je ne puis jamais un seul moment me trouver moi-même fixe et présent à moi-même pour dire simplement, *Je suis*.⁵

Fénelon's description of the self as "nearly nothing," and as "un milieu incompréhensible," echoes—as we will see—Pascal's description of man's place between the infinitesimal and the infinite in the passages in the *Pensées* entitled "Disproportion of Man" and "*Infinité*."⁶ The Cartesian punctual *I* is always disappearing, Fénelon complains. This point is a limit to reflection; when we try to grasp it, we are left with only a *je ne sais*

⁵ François Fénelon, *De l'existence de Dieu*, II, 5, §89, in *Œuvres complètes* (Paris: J. Leroux et Jouby, 1851), 1:79 (discussed in Köhler, "Je ne sais quoi," 254–255).

⁶ Blaise Pascal, *Pensées* nr. 199 and 418, in *Œuvres complètes*, ed. Louis Lafuma (Paris: Seuil, 1963), 525–526 and 550–551.

quoi. Because this *I* ceases “dans l’instant même où il commence,” it does not exist in time at all. I can never say “je suis,” because I can never grasp this moment to hold on and refer back to it.

More broadly, Jansenists alleged that the Jesuits’ use of the *je ne sais quoi* as a description of God’s grace was blasphemous; furthermore, proponents of the new mechanical philosophy accused the scholastics of pretending to explain natural phenomena through what was in fact a *je ne sais quoi*, thereby rendering them unintelligible. The latter charge usually assumed that the scholastics were purporting to explain nature but were in fact only designating it by an empty name—in other words, that they were misled by their ability to name something into believing that they were thereby saying something informative about it. In *An Essay Concerning Human Understanding*, Locke famously asserts that the concept of substance is merely a placeholder, a *je ne sais quoi*: “For our idea of substance is equally obscure, or none at all, in both; it is but a supposed *I-know-not-what*, to support those ideas we call ‘accidents’.”⁷ According to these critics, this linguistic procedure led to vacuous concepts like that of substantial form. But this very procedure was sometimes accepted by the proponents of the School philosophy and interpreted as a theoretical virtue. Indeed, the first treatise to make the *je ne sais quoi* an object of extended theoretical inquiry, Dominique Bouhours’s 1671 *Entretiens d’Ariste et Eugène* concludes by suggesting that substantial form is truly a divine *nesquiddity*.⁸ Bouhours affirms that divine grace itself consists in a “*je ne sais quoi* surnaturel qu’on ne peut ni expliquer ni comprendre,” a definition that Voltaire would

⁷ John Locke, *An Essay Concerning Human Understanding* (Amherst, N.Y.: Prometheus Books, 1995), II, 23, §15, p. 216 (my emphasis).

⁸ See Scholar, *The Je-ne-sais-quoi*, 115, for this point.

later celebrate: “Saint Thomas appelle la grâce une forme substantielle; et le jésuite Bouhours la nomme *un je ne sais quoi*; c’est peut-être la meilleure définition qu’on en ait jamais donnée.”⁹

In contrast to the Jesuit Bouhours’s characterization of the *je ne sais quoi* as divinely inspired, the Jansenist Blaise Pascal considered it to be the mark of man’s fallenness. Like Bouhours, Pascal sees the *je ne sais quoi* as a governing principle of the world. For Pascal, however, it consists in a monstrous disproportion between cause and effect. Pascal claims that everything could have turned out differently—the world could have ended up utterly otherwise than it did—if Cleopatra’s nose had been slightly longer or shorter. Because of this minute difference, she would have lost the *je ne sais quoi* upon which her power depended. The fragility of the *je ne sais quoi* demonstrates, for Pascal, that the principle of the *presque tout* is a *presque rien*. This ineffable *peu de chose* occasions universal devastation:

Qui voudra connaître à plein la vanité de l’homme n’a qu’à considérer les causes et les effets de l’amour. La cause en est un je ne sais quoi. Corneille. Et les effets en sont effroyables. Ce je ne sais quoi, si peu de chose qu’on ne peut le reconnaître, remue toute la terre, les princes, les armées, le monde entier.¹⁰

The principle of all change is a disproportion between cause and effect: from the smallest alteration, the largest change can follow. The power of the *je ne sais quoi* seems to consist in this discontinuity in magnitude: the infinite arises from the infinitesimal. Alluding to Corneille, Pascal uses the phrase “*je ne sais quoi*” to designate more than what is announced in the nominalized construction: it stands for something irreducibly irrational

⁹ Voltaire, *Dictionnaire philosophique*, s.v. *Grâce*, in *Œuvres complètes* (Paris: Renouard, 1819–25), 4:331 (discussed in Köhler, “*Je ne sais quoi*,” 263).

¹⁰ Pascal, *Pensées*, nr. 413, in *Œuvres complètes*, 549.

that breaks the laws of proportion between cause and effect. According to Pascal, this disproportion defines man's place in the "middle" of the cosmos and it describes his fallen, sinful state. Whereas for Descartes the *je ne sais quoi* provides the clue to uncovering the unique certainty brought to light in self-cognition, for Pascal it only marks man's disproportionality, his place as a being that can contemplate the infinity of the universe but only know it as a *je ne sais quoi*.

In his *Entretiens*, Bouhours makes the *je ne sais quoi* the subject of an extended dialogue between the protagonists, Ariste and Eugène. The *je ne sais quoi* is introduced to explain the particular, lasting pleasure that Ariste and Eugène take in one another's company. They characterize it as a certain something that is irreducible to properties that could be conceptually defined. Eugene claims that this conceptual elusiveness resides in its being "imperceptible" to the soul and speculates that the reason for this lies in the quality's acting too "quickly" for the soul to perceive it. According to Bouhours, the *je ne sais quoi* is the cause of the natural "sympathy" within society, as well as the ground—irreducible to "toutes ces qualités"—for our immediate judgments of liking or disliking. For Bouhours, a *je ne sais quoi* in objects and people provides the ground for otherwise inexplicable judgments, but there is also a *je ne sais quoi* within taste itself. This subjective taste combines with the corresponding objective property to constitute *délicatesse*: "Les pièces les plus savantes et même les plus ingénieuses ne sont point estimées dans notre siècle, si elles ne sont touchées délicatement. Outre ce qu'elles ont de solide et de fort, il faut qu'elles aient je ne sais quoi d'agréable et de fleuri pour plaire aux gens de bon goût,

et c'est ce qui fait le caractère des belles choses."¹¹ Despite Bouhours's use of the *je ne sais quoi* to define what is pleasing in works of art, he claims that a person's *je ne sais quoi* can never be conveyed by a representation: "La description la plus avantageuse et le portrait le plus flatté peuvent donner de l'estime pour la personne et une grande envie de la voir, mais ni l'un ni l'autre ne cause jamais une vraie inclination, parce que le pinceau et la langue ne peuvent exprimer le je ne sais quoi, qui fait tout."¹² This passage might appear to be in tension with Bouhours's descriptions of the *je ne sais quoi* in works of art because it seems to claim that works of art can never express this mysterious something.

Bouhours's claims can be reconciled, however, if we interpret this passage not as denying that beautiful works of art have a *je ne sais quoi* but as asserting that even these beautiful works cannot reproduce the all-powerful *je ne sais quoi* of the person. This suggests that the *je ne sais quoi* of the person is unique for Bouhours, or at least that it is too complex or fine-grained to be captured in artwork created by any human being. Like Pascal, Bouhours sees the *je ne sais quoi* as *all-powerful*—as an ineluctable quality that can change *everything*, but Bouhours judges this certain something favorably, because it provides the occasion for "une vraie inclination." The *je ne sais quoi* is not a barrier but an incitement to the search for truth.

Three years after Bouhours's *Entretiens*, Nicolas Boileau published a translation and commentary entitled *Reflexions sur Longin*, which describes the effect of amazement certain texts have upon the reader. The treatise collects and classifies the ways in which

¹¹Dominique Bouhours, *Entretiens d'Ariste et d'Eugène*, ed. René Radouart (Paris: Bossard, 1920), 154–155 (quoted and discussed by Köhler, "Je ne sais quoi," 257). For a discussion of Bouhours' *délicatesse*, see Köhler, "Je ne sais quoi," 257ff.

¹² Bouhours, *Entretiens d'Ariste et d'Eugène*, 205.

literary works can be “sublime”—that is, can have a particularly great “height” or “magnitude.” The *je ne sais quoi* and the sublime both became objects of scrutiny for later aesthetic theory. They were commonly linked and cited as either the initial signs of the eventual triumph of a principle of individuality or as indicating the emergence of a principle of irrationality within aesthetic theory, culminating in the liberation of aesthetic feeling from the strict rules of classicism.¹³ Perhaps the most prominent recent discussion can be found in Louis Marin, who argues that the *je ne sais quoi* and the sublime are in fact identical: “The sublime is thus the elusive *je ne sais quoi* not only of the rhetoric and poetics of genres and styles, of their rules and figures, but also of all aesthetic response, of value judgments based on taste, of art theory in general.”¹⁴ Marin claims that while the writers of French classicism sought to constrain the *je ne sais quoi* within an “aesthetics of representation,” Pascal broke this mold and anticipated the Romantic aesthetic of the fragment. Kant, according to Marin, finally fulfilled the promise offered in Pascal’s sublime by developing an account of the specific pleasure that results from that which exceeds the order of representation. Kant’s account of a complex pleasure taken in a

¹³ For just one example of this story, see Köhler, “*Je ne sais quoi*.” For an argument locating the historical importance of the development of aesthetics in an increasing awareness of the problems of individuality and irrationality, see Alfred Bäumler’s classical study, *Das Irrationalitätsproblem in der Ästhetik und Logik des 18. Jahrhunderts bis zur Kritik der Urteilskraft* (Tübingen: Max Niemeyer, 1967). Bäumler is almost unique in seeing the connection between the logical problem of individuation as it was developed in late seventeenth- and early eighteenth-century metaphysics and the contemporaneous discussions of taste and of sensible cognition more generally. For a contrasting account of the systematic place of aesthetics in the eighteenth century, see Ernst Cassirer’s chapter, “Die Grundprobleme der Ästhetik” in *Die Philosophie der Aufklärung* (Hamburg: Felix Meiner, 1998), 368–482. While Bäumler focuses on the problem of individuation and irrationality, Cassirer argues for the importance of critique in the transition from a metaphysics of substance to a philosophy based on the concept of function.

¹⁴ Louis Marin, “On the Sublime, Infinity, *Je Ne Sais Quoi*: 1674, Nicolas Boileau-Despréaux translates from the Greek Longinus’ Treatise *On the Sublime*,” in Denis Hollier et al., eds., *A New History of French Literature* (Cambridge, Mass.: Harvard University Press, 1989), 340–345 at 342.

perception of infinity—a perception that overwhelms the representational capacities of the subject—provides, for Marin, the key to the Romantic aesthetic theory he himself champions. Similarly, Jean-Luc Marion celebrates Kant’s account of the sublime for presenting an account of a phenomenon that would overwhelm our cognitive capacities. Marion charges Kant with conceiving of phenomenal content on the basis of “poor”—rather than “saturated”—phenomena in the *Critique of Pure Reason*. In the section on the sublime in the third *Critique*, however, Marion claims that Kant finally manages to escape from the constraints of his theoretical framework and to conceive of an “unbearable” phenomenon.¹⁵

Marion’s plea for the primacy of “saturated phenomena”—as well as Marin’s triumphalist narrative—must, however, flatten out the history of the *je ne sais quoi* and the sublime in order to claim that Bouhours and Boileau anticipate Kant. Attending to these complexities disturbs the smooth surface of Marin’s and Marion’s reflections, casting doubt on accounts that interpret this history as the progressive liberation of aesthetic feeling. In fact, I shall argue, it is Leibniz—for Marin the “arch-rationalist”—who transforms the *je ne sais quoi*, making it a central concept in his account of perception. Examining Leibniz’s account of the *je ne sais quoi* provides a new perspective on the relation between this concept and that of the sublime, one which allows for a reconsideration of Kant as well.

2. *Petites perceptions*

¹⁵ Jean-Luc Marion, *Being Given: Towards a Phenomenology of Givenness*, trans. Jeffrey K. Kosky (Stanford: Stanford University Press, 2002), 202ff.

In the Preface to the *New Essays on Human Understanding*, Leibniz argues against Locke and the Cartesians that the mind always thinks. The soul has perceptions even “quand on dort sans avoir des songes,” because “naturellement une substance ne sauroit estre sans actions.” Since the soul’s activity consists in perception, the soul must always be perceiving, even when it is unconscious. Leibniz claims that there are “mille marques qui font juger qu’il y a à tout moment une infinité de *perceptions* en nous, mais sans apperception et sans reflexion, c’est à dire des changements dans l’ame même dont nous ne nous appercevons pas, parce que les impressions sont ou trop petites et en trop grand nombre ou trop unies, en sorte qu’elles n’ont rien d’assez distinguant à part” (GP 5:46; NE Preface, 53). The soul is not only never without perception; it has an infinity of perceptions, but these perceptions “n’ont rien d’assez distinguant” for us to be aware of them.¹⁶ He presents two grounds for this unawareness: the impressions may be “ou trop petites et en trop grand nombre ou trop unies.” The second possibility implies that perceptions must stand in sufficient contrast to other perceptions for the soul to take notice of them; the first possibility claims that they may be of insufficient *size* to be noticed. Leibniz’s discussion raises a question that will be central to this study: what does it mean for a perception to have a size? A perception, for Leibniz, is a property of an

¹⁶ Leibniz’s contrast between “distinct” and “confused” perceptions raises difficult interpretive issues. While some commentators—including Robert McRae and G.H.R. Parkinson—have maintained that perceptual distinctness is equivalent to degree of consciousness, Margaret Dauler Wilson argues that these categories cannot be identified, because even bare monads will have some perceptions that are relatively distinct with regard to other perceptions. See Wilson, “Confused vs. Distinct Perception in Leibniz: Consciousness, Representation, and God’s Mind,” in her *Ideas and Mechanism: Essays on Early Modern Philosophy* (Princeton: Princeton University Press, 1999), 336–352, especially 338–340, citing and critiquing Robert McRae, *Leibniz: Perception, Apperception, and Thought* (Toronto: University of Toronto Press, 1976), 36 and G.H.R. Parkinson, “The ‘Intellectualization of Appearances,’” in Michael Hooker, ed., *Leibniz: Critical and Interpretive Essays* (Minneapolis: Minnesota University Press, 1982), 3–20 at 6.

immaterial substance, so the perception is itself unextended. While one might think that perceptions could have temporal dimension and use this feature to explain their magnitude, Leibniz does not use size in this sense. Instead, the magnitude of a perception is intensive: a perception has a certain degree of strength. For a perception to be minute is for it to be too weak to rise to the threshold of consciousness.

Leibniz offers an illustration to depict the nature of the *petites perceptions* unaccompanied by awareness but which nevertheless “jointes à d’autres ... ne laissent pas de faire leur effect et de se faire sentir au moins confusement dans l’assemblage”:

Et pour juger encor mieux de petites perceptions que nous ne saurions distinguer dans la foule, j’ay coutume de me servir de l’exemple du mugissement ou du bruit de la mer dont on est frappé quand on est au rivage. Pour entendre ce bruit comme l’on fait, il faut bien qu’on entende les parties qui composent ce tout, c’est à dire les bruits de chaque vague, quoyque chacun de ces petits bruits ne se fasse connoistre que dans l’assemblage confus de tous les autres ensemble, c’est à dire dans ce mugissement même, et ne se remarqueroit pas si cette vague qui le fait, estoit seule. Car il faut qu’on en soit affecté un peu par le mouvement de cette vague et qu’on ait quelque perception de chacun de ses bruits, quelques petits qu’ils soyent; autrement on n’auroit pas celle de cent mille vagues, puisque cent mille riens ne sauroient faire quelque chose. (GP 5:46–47; NE Preface, 54)

The tiny noises produced by each wave, which combine to form the roaring sound of the sea, are *petites perceptions*. Although we cannot pick out the sound of each individual wave, we must perceive it in order to hear the roaring sea, since “cent mille riens ne sauroient faire quelque chose.” Leibniz’s example raises several questions. First, in what sense are minute perceptions the “parts” of our whole perceptual states? The composition of the roaring sound of the sea out of its minute parts does not seem to function as it does for spatiotemporally extended objects. Second, what is the magnitude of these minute perceptions? Are they comparable in measure to other perceptions or do they have a

“lower” order of magnitude? Third, are they themselves simple or complex? Could they be compared to “atoms” of perceptions? Are they indivisible? These questions, which I will address in the second chapter, concern the nature of intensive magnitude. Leibniz does not directly consider them in his discussion of the sea, although they are central to the account of the activity of substance he develops in his works from the mid-1670s onward. Instead, he draws the following conclusion:

Ces petites perceptions sont donc de plus grande efficace par leur suites qu’on ne pense. Ce sont elles qui forment ce je ne sçay quoy, ces gouts, ces images des qualités des sens, claires dans l’assemblage, mais confuses dans les parties, ces impressions que des corps environnans font sur nous, qui enveloppent l’infini, cette liaison que chaque estre a avec tout le reste de l’univers. On peut même dire qu’en consequence de ces petites perceptions le present est gros de l’avenir et chargé du passé, que tout est conspirant (σύμπνοια πάντα, comme disoit Hippocrate) et que dans la moindre des substances, des yeux aussi perçans que ceux de Dieu pourroient lire toute la suite des choses de l’univers.

Quae sint, quae fuerint, quae mox futura trahantur. (GP 5:48; NE Preface, 54–55)

Petites perceptions explain how a limited—in some sense “finite”—substance can nevertheless represent the entirety of the universe; the soul can have an infinity of perceptions, because these perceptions fall below the threshold of awareness. It is the fact that created substances have a limited degree of representational force but nevertheless perceive an infinity of things that explains our perceptual confusion—that we cannot pick out all of the “parts” that, in some sense, “compose” the totality. The confusion of sensible impressions is not, therefore, a peripheral feature of some perceptions that could be eliminated by redirecting our attention from the senses to thought, but instead a constitutive feature of the sort of perceptual beings we are: as finite, created substances, we have a limited capacity to represent the unlimited. We do not represent only a part of the whole, but represent the whole in a “partial” manner. The *je ne sais quoi* is thus an

essential aspect of perception, according to Leibniz. Since our eyes are not “aussi perçans que ceux de Dieu,” we cannot see the minute perceptions within our total perceptual states, and we thus perceive them only as possessing a certain something. The theory of the *je ne sais quoi* reflects the difference between the Cartesian model of mental activity as consciousness and Leibniz’s account of thought as perception, consisting in a expressive relation to the whole world—including its past and future states.¹⁷ The *je* in *je ne sais quoi* therefore acquires a new significance. For Descartes, it is the self that is revealed in an activity unfamiliar to us—because usually obscured by the imagination. In Leibniz’s theory, on the other hand, it is the *I* that does not know, because perception does not essentially involve conscious activity. In this sense, the *je ne sais quoi* takes on a new meaning in Leibniz’s doctrine of perception: thinking is no longer defined in terms of an *I* that is aware of what it thinks.

These *petites perceptions*, Leibniz claims, are that in virtue of which everything harmonizes in a *sympnoia panta*. The concept of harmony does not only play a role in Leibniz’s theory of “preestablished harmony”—the complete correspondence between mind and body that he uses to solve the problem of how material and immaterial substances could affect one another, famously denying that this relation is causation at all. The *sympnoia panta*—the complete harmony of all things—also reflects Leibniz’s adherence to the law of continuity. After explaining that *petites perceptions* are what constitutes personal identity, even in the absence of memory, and that these perceptions allow us to account for “l’apparence d’une *indifférence d’équilibre*” (GP 5:48), Leibniz

¹⁷ See Allison Simmons, “Changing the Cartesian Mind: Leibniz on Sensation, Representation and Consciousness,” *Philosophical Review* 101 (2001): 31–75 for an extensive comparison between Descartes’s and Leibniz’s theories of the mind’s activity.

concludes by declaring that the law of continuity provides the grounds for the theory of *petites perceptions*:

En un mot les *perceptions insensibles* sont d'un aussi grand usage dans la Pneumatique que les corpuscules insensibles le sont dans la Physique, et il est également déraisonnable de rejeter les uns et les autres sous pretexte qu'elles sont hors de la portée de nos sens. Rien ne se fait tout d'un coup, et c'est une de mes grandes maximes et des plus vérifiées que *la nature ne fait jamais des sauts*: ce que j'appellois *la Loy de la Continuité*, lorsque j'en parlois dans les premières Nouvelles de la Republique des lettres, et l'usage de cette Loy est tres considerable dans la physique: elle porte qu'on passe tousjours du petit au grand et à rebours par le mediocre, dans les degrés comme dans les parties (GP 5:49; NE Preface, 56)

Leibniz's reference to changes in degree as well as in parts shows that the law of continuity holds for intensive as well as extensive change. Leibniz is offering a general theory of continuity and explicitly includes variations in intensive magnitude. But, I shall argue, the law of continuity has a still closer relation to intensive magnitudes, because the ban on "leaps" is incompatible with a metaphysical model that would take extended substance as fundamental. The law of continuity implies a model of substantial activity as variation in intensive magnitude.

3. Intensity

"Intensive magnitude," as I shall use the term, denotes any magnitude that is not essentially spatiotemporal. Pain, brightness, warmth, and health are classic examples, but moral qualities, such as justice, virtue, or charity also have degrees. Like determinations of spatiotemporal properties—such as size and duration—intensive magnitudes can be ordered according to "how much" of a property is possessed, but since the intensive magnitude of a property is not essentially spatiotemporal, our ordinary explanations for

quantitative variations are insufficient: we cannot explain what it is to have more or less of a quality by appealing to the quality's occupying different amounts of time and space, as we account for differences in length by saying that the longer body occupies more space than the shorter. Intensive magnitudes are fully present within a single instant and within a single entity. Furthermore, if they have parts that can be added to one another, then this addition cannot follow the same principles governing addition of extended magnitudes: if a brighter light is combined with a less bright light, the resulting light does not have a magnitude equal to the sum of the component brightnesses. Perhaps most fundamentally, intensive magnitudes seem puzzling because an entity seems to possess a quality as a unity—that is, the quality-instance seems to be possessed simply. If this is the case, however, then how can the quality increase and decrease while still retaining its identity? If this is to be explained by its having parts, then these must be parts that only exist in virtue of the whole, contrary to the common assumption that a whole exists in virtue of its parts.

These problems, as well as difficulties arising from particular metaphysical theories concerning the nature of qualities, were extensively discussed in the philosophical tradition from Aristotle onward.¹⁸ The point of departure for this debate—known as the problem of the *intensio et remissio formarum*—is found in a passage of Aristotle's *Categories*:

¹⁸ For the classic history of this debate, see Anneliese Maier, *Das Problem der intensiven Größe in der Scholastik: De intensione et remissione formarum* (Leipzig: Heinrich Keller, 1939). I draw extensively on Maier's account in the following summary. For a brief history of the problem focusing on the so-called "Oxford Calculators"—Walter Burley, Roger Sineshead, and John Dumbleton—see E.D. Sylla, "Medieval Concepts of the Latitude of Forms: The Oxford Calculators," *Archives d'histories doctrinale et littéraire du Moyen Age* 48 (1973): 223–283. Sylla defines the Oxford Calculators' concept of latitude as "a range within which a given form, *complexio*, quality, or quantity can vary," noting that forms with latitudes are contrasted with those

Qualifications admit of a more and a less; for one thing is called more pale or less pale than another, and more just than another. Moreover, it itself sustains increase (for what is pale can still become paler)—not in all cases though, but in most. It might be questioned whether one justice is called more a justice than another, and similarly for the other conditions. For some people dispute about such cases. They utterly deny that one justice is called more or less a justice than another, or one health more or less a health, though they say that one person has health less than another, justice less than another, and similarly with grammar and the other conditions. At any rate the things spoken of in virtue of these unquestionably admit of a more and a less: one man is called more grammatical than another, juster, healthier, and so on.¹⁹

Aristotle goes on to distinguish qualities that admit of a “more and a less” from those—such as geometrical figures—that do not. A figure is either a circle or it is not, he claims, and a circle is not “more like” a square than a triangle is. One might object that we do refer to things as more or less circular—that is, as approaching the geometrical circle more closely. Aristotle, however, seems to be referring to the geometrical figures themselves. A shape with some jagged edges that roughly appears circular, on his account, does not possess the property being-a-circle, although it might possess some other property of circularity that does admit of the “more or less.”

One question raised by Aristotle’s discussion of the “more or less” of a quality concerns whether the quality itself can be more or less or whether the entities instantiate

that are indivisible. She remarks that this usage differs from that of Nicole Oresme “for whom latitudes are intensive measures of particular qualities and not ranges or abstractions” (229). While I cannot do more than mention Oresme’s contribution here, his graphical representation of qualitative variations had important implications for the development of mathematical concepts and forms of geometrical representation in the late middle ages and early modern period. See *Nicole Oresme and the Medieval Geometry of Qualities and Motions: A Treatise on the Uniformity and Difformity of Intensities Known as “Tractatus de configurationibus qualitatum et motuum,”* ed. Marshall Clagett (Madison: University of Wisconsin Press, 1968), as well as Anneliese Maier, “Die Mathematik der Formlatituden,” in *An der Grenze von Scholastik und Naturwissenschaft*, 2nd edn. (Rome: Storia e Letteratura, 1952), 257–384.

¹⁹ *Categories* 8, 10b26, in *Aristotle’s Categories and De Interpretatione*, trans. J.L. Ackrill (Oxford: Clarendon Press, 1963).

the quality to different degrees. Aristotle's response to those who deny that "one justice is called more or less a justice than another" might suggest, as it did for many of his commentators, that he holds the view that only instantiations of qualities—what we can call the *quale*—vary by "more or less." The quality itself remains the same. But Aristotle does not clearly endorse one position over the other. This raises the question known in later discussions as the *secundum quid*—in virtue of what can more or less of a quality be said? Is more or less of a quality instantiated because of the *bearer* of the quality? Or in virtue of something in the quality itself?

The aspect of intensive magnitudes that was particularly problematic for Aristotle's commentators concerned change in the amount of a quality. First, one might ask whether it is the same quality that varies in degree or whether a different quality is instantiated whenever the degree changes. Aristotle's discussion of qualitative variation at *Categories* 8 seems to imply that there can be more or less of the same quality, but this view seems to conflict with another central Aristotelian commitment: qualities are forms and forms are unchanging. According to a widely-held Aristotelian tenet, *formae sunt sicut numeri*.²⁰ Like numbers, forms are simple, unchanging entities that cannot themselves be "more or less." Against this principle, many scholars in the Middle Ages contended that some forms have a certain "latitude": they can come in a variety of degrees without undergoing a change in "species." Simply admitting that some forms have this latitude does not, however,

²⁰ Compare *Metaphysics* H, 3, 1043b33–1044a9; Δ, 14, 1020b 7–8. Maier cites the *Liber sex principiorum* for a particularly concise formulation of the problem: "Aus dem dem Gilbertus Portanus zugeschriebenen *Liber sex principiorum* wird vor allem der Satz zitiert, mit dem das ganze Werk beginnt: Forma est simplici et invariabili essentia consistens. Er bildet neben dem Aristoteleswort 'formae sunt sicut numri'—jede Änderung ändert dies Spezies—das klassische Argument, das gegen die Möglichkeit der intensio und remissio überhaupt vorgebracht und dann widerlegt oder eingeschränkt zu werden pflegt." *Das Problem der intensiven Größe*, 11–12.

resolve the question of the metaphysical status of this “indetermination” within the form.²¹ The conflict between an unchanging form and the evident changes in qualities generated a lively debate extending from Aristotle’s first commentators to the seventeenth-century scholastics.²² While this discussion continued through Leibniz’s lifetime, he did not participate in it directly, because he did not share the theoretical commitments in which the question was posed. The new “mechanical philosophy” rejected the scholastic debate as relying on an outdated conception of form to explain qualitative changes.²³ While Leibniz was never a complete adherent of the mechanical philosophy and his earliest works subscribe to a broadly Suarezian metaphysics, by 1669, he endorsed the principle that changes in the natural world were to be accounted for by local motion alone.²⁴ In his April 20/30, 1669, letter to Thomasius, Leibniz writes that this doctrine, held by “philosophical reformers” (L 95; GP 4:164), can be reconciled with

²¹ I borrow this term from J.L. Solère, “The Question of Intensive Magnitudes According to Some Jesuits in the Sixteenth and Seventeenth Centuries,” *Monist* 84 (2001): 582–616, here 585.

²² Christian Wolff’s discussion of intensity, although not explicitly Aristotelian, may, as we shall see, be considered a particularly late contribution to this debate.

²³ See Maier’s summary of this development: “Die einzelnen festen Schulmeinungen, die sich in der Scholastik herausgebildet hatten, haben sich durch die folgenden Jahrhunderte ziemlich konstant fortgesetzt. ... Aber im ganzen war es ein langsames Erstarren, das keine Möglichkeit für einen Neueinsatz der Entwicklung bot. Das ist so weitergegangen, bis um 1600 der Einbruch von anderer Seite erfolgte. Die wiederauflebende Atomistik hat die entscheidende Wendung gebracht, die zur Mechanisierung alles Qualitativen führte, d.h. zur Erklärung durch Größe, Gestalt und Bewegung letzter, kleinster Korpuskel.” *Das Problem der intensiven Größe*, 75–76. See also Maier’s *Die Mechanisierung des Weltbilds im 17. Jahrhundert* (Leipzig: Felix Meiner, 1938).

²⁴ For a recent reappraisal of Leibniz emphasizing the continuity between his work and that of Suarez, particularly in his concept of individuals, his principle of individuation, and his commitment to moderate nominalism, see Lawrence McCullough, *Leibniz on Individuals and Individuation* (Dordrecht: Kluwer, 1996). McCullough argues that the idea of a strict division between pre-modern and modern philosophers—Leibniz preeminent among them—is radically misleading. Although he does not deny the importance of the mechanical philosophy for Leibniz, McCullough sees Leibniz as synthesizing these new theories with those of School metaphysics. In particular, McCullough holds that the problem of the individuation of substances occupied Leibniz throughout his life, from his 1663 Baccalaureate dissertation to the *Monadology*.

the doctrines of Aristotle.²⁵ Furthermore, there is no need to appeal to forms at all to explain the qualitative properties of entities:

For example, since white is what reflects the most light and black is what reflects the least, those things whose surfaces contain many small mirrors will be white. This is why foaming water is white, for it consists of innumerable little bubbles, and each bubble is a mirror, while before, the water as a whole was but one mirror—just as there are as many mirrors as there are fragments when a glass mirror is broken. This is also why pounded glass is whiter than when it is intact. Similarly, water broken into distinct mirrors by bubbles therefore becomes white, and this is also the reason why snow is whiter than ice, and ice than water. For it is false that snow is condensed water; it is rather rarefied and therefore is lighter than water and occupies more space. The sophism of Anaxagoras about black snow is to be refuted in this way. Such considerations make it clear that colors arise solely from a change of figure and position in a surface. If we had space, it would be easy to explain light, heat, and all qualities in the same way.

Now if qualities are changed by motion alone, substance will also be changed by that very fact ... (L 96–97)²⁶

²⁵ “Nam vel ostenditur Philosophiam Reformatam Aristotelicae conciliari posse et adversam non esse, vel ulterius ostenditur alteram per alteram explicari non solum posse, sed et debere, imo ex Aristotelicis principiis fluere ea ipsa quae a recentioribus tanta pompa jactantur” (GP 4:164; L 95). For a discussion of this letter in the context of Leibniz’s correspondence with his former teacher, see Christia Mercer, “Leibniz and His Master: The Correspondence with Jakob Thomasius,” in Paul Lodge, ed., *Leibniz and His Correspondents* (Cambridge: Cambridge University Press, 2004), 10–46. As Mercer notes, Leibniz subsequently published a lightly-revised version of the April 1669 letter as an appendix to the introduction to his edition of the humanist Mauro Nizolio’s *On the True Principles and the True Method of Philosophy, Against the Pseudo-philosophers* (14). Mercer shows that although Thomasius himself endorsed a form of conciliatory eclecticism that attempted to unite the moderns with the ancients, he was critical of many of Leibniz’s specific proposal to reconcile Aristotle with the mechanical philosophy. In the fall of 1668, Leibniz had sent Thomasius a proposal for interpreting Aristotle’s substantial form as *figura* (22–23). Thomasius responded critically to Leibniz’s letter, objecting both to Leibniz’s faulty historical understanding and to his misguided adherence to Cartesianism (23–25). “In the end, Thomasius disapproves of any attempt to forge a synthesis of the mechanical philosophy with Aristotelian tenets that requires such a radical departure from the thought of Aristotle himself. Part of Thomasius’s point seems to be that because no self-respecting Aristotelian will condone this ‘reform’ of substantial form, there is little hope of forging genuine peace between Aristotelians and mechanists. Moreover, it also follows that because no self-respecting Aristotelian will admit that there is nothing in body ‘other than matter and figure,’ Leibniz’s argument for the existence of God begs the question and will not be taken seriously by any thoughtful student of Aristotle” (24–25). In the April 1669 letter, Leibniz defends his specific proposals for reform and reconciliation against Thomasius’s charges (31–36).

²⁶ GP 1:19–20: “v.g. cum album sit quod lucem plurimam reflectit, nigrum quod parvum, erunt ea alba, quorum superficies multa parva specula continet; haec ratio est cur aqua spumescens sit alba, quia innumeris bullulis constat, quot autem bullulae, tot specula: cum ante tota fere aqua

While Leibniz later abandons the thesis that nothing beyond local motion is required for change when he comes to the conclusion that changes in the material world depend upon a principle of activity and invokes substantial forms to explain this principle, he never returns to the scholastic account of the *intensio et remissio formarum*. It is nevertheless helpful to summarize briefly the central debate in order to understand the various positions and to appreciate Leibniz's radically new account of the metaphysical status of intensive magnitudes.²⁷ Furthermore, Leibniz was very likely aware of the major positions in this debate: Suarez, on whom Leibniz relied extensively in his early works, devotes an entire book of his *Disputationes metaphysicae* to the problem of intensive variation, and Goclenius's popular dictionary of philosophical terms contains a several pages-long entry

non nisi unum speculum fuerit; quemadmodum speculo vitreo fracto quot partes tot specula fiunt: quae etiam causa est, cur vitrum contusum sit albius integro. Similiter igitur aqua per bullulas indistincta velut specula fracta albedo oritur, quae ratio etiam est, cur nix sit albius glacie, et glacies aqua. Falsum enim est nivem esse aquam condensatam, cum sit rarefacta potius, unde et levior aqua est et plus spatii occupat. Qua ratione sophisma Anaxagorae de nive nigra diluitur. Et hinc jam patet sola figurae et situs in superficie mutatione colores oriri; idem de luce, calore et omnibus qualitatibus, si locus pateretur, facile explicari posset. Jam vere, si qualitates per solum motum mutantur, eo ipso et substantia mutabitur; mutatis enim omnibus, imo et quibusdam, requisitis, res ipsa tollitur." Leibniz refers here to Anaxagoras's thesis that even snow, which appears to be white, contains miniscule amounts of black within it. This claim follows from Anaxagoras's general principle that everything must be contained in everything ("In everything there is a share of everything," fr. B11 D-K) and shows that the senses cannot be relied upon for knowledge but must be corrected by the intellect. In *Outlines of Pyrrhonism*, Sextus Empiricus summarizes Anaxagoras's argument: "We set what is thought in opposition to what appears, as Anaxagoras set the appearance that snow is white in opposition to the claim that snow is frozen water, water is black, and that snow is solidified from it" (fr. A97 D-K). All translations are taken from *Anaxagoras of Clazomenae: Fragments and Testimonia*, trans. and ed. Patricia Curd (Toronto: University of Toronto Press, 2007). As Christia Mercer notes, Leibniz's second letter to Thomasius, written in February 1666, offers a solution to Anaxagoras's puzzle concerning black snow by claiming that color is only an idea in the mind and by invoking Gassendi's account of perception (A2.1.4–5, cited in Mercer, "Leibniz and His Master," 21–22). Mercer argues, however, that this argument does not reflect Leibniz's own position and should be interpreted as an exercise for his "former master" (22).

²⁷ In *Die Mechanisierung des Weltbilds*, Maier acknowledges the importance of Leibniz's new concept of force, writing that it represents "eine radikale Überwindung der Mechanistik" (57) but does not develop its implications for the problem of intensive magnitudes.

on “intensio,” in which he extensively cites William of Ockham and his follower, Gabriel Biel.²⁸

As mentioned, one of the central questions raised by Aristotle’s text concerns the *bearer* of the change in intensity: whether it is the quality itself or the quality-instantiated-in-a-subject—the so-called *quale*—that admits of variation in intensity. Several answers to this question were sketched by the sixth-century commentator Simplicius. He distinguishes four positions: (1) Only immaterial qualities can submit of intensification or remission; (2) both qualities and *qualia* can vary in intensive magnitude; (3) only *qualia* can be intensified or remitted; (4) the Stoic opinion that only virtues can be intensified or remitted, while sensible qualities (*mediae artes*) cannot be. Simplicius characterizes the alternatives with regard to the *secundum quid?* question as follows: whether there is *intensio secundum formam ipsam* or *intensio secundum participationem subiecti*—whether intensification is in virtue of the form itself or according to the participation of the subject.²⁹

In addition to the question of *secundum quid*, Aristotle’s commentators debated the mode by which qualities became more or less intense. Was this by a succession of different forms? Or by the addition of “parts” of the form? This question appears to have

²⁸ See *Disputationes Metaphysicae* (Hildesheim: Olms, 1965), XLVI, s. 1, which concerns the question “[u]trum qualitas intensibilis et remissibilis sit in se indivisibilis vel composita ex gradibus entitatis.” In his *Lexicon philosophicum, quo tanquam clave philosophicae fores aperiuntur* (Frankfurt: Vidua Matthiae Beckeri, 1613; rpt. Olms: Hildesheim, 1980), s.v. “intensio,” 256–258, Goclenius writes: “Intensio seu intensiua augmentatio est additio gradus ad gradum quae sunt partes formae in parte eadem subiecti; simul & penetratiue existentes, per quam forma ipsa fit perfectionem, non extensue maior.” For a helpful discussion of this problem in later scholasticism, as well as a brief history of the problem in earlier writers, see Solère, “The Question of Intensive Magnitudes.” Solère summarizes the problem in late Antiquity as follows: “Does intensification occur in the form itself, or in the subject? Equivalently we can ask: has each form an absolutely determinate and unvarying nature (so that variation only depends on the subject), or do some forms have in their nature a certain ‘latitude’ so that they can be in themselves realized to a greater or lesser degree?” (583).

²⁹ Maier, *Das Problem der intensiven Größe*, 10.

arisen through the theological discussion regarding whether charity could be augmented. In the twelfth century, Peter Lombard poses the problem of how charity can increase or diminish in man, when, according to Augustine, charity is identical with the Holy Spirit and thus immutable.³⁰ Duns Scotus, and the Franciscan tradition as a whole, held the “additive theory” of intensification and remission of forms, according to which the intensity of a form is increased by adding a part to another to form a new unity—as, Anneliese Maier writes, a new portion of water can be added to an existing amount to form a unity, rather than as an additional stone is added to a heap.³¹ William of Ockham, as well as the Oxford Calculators, all held versions of Scotus’s theory that intensification consists in an additive increase in which the original quality remains in the substance as a

³⁰ In “The Question of Intensive Magnitudes,” Solère claims that Peter Lombard’s discussion of charity was particularly important not only for introducing a dominant theological concern into the problem of intensive magnitudes but also for his use of the term “augmentation.” According to Solère, this led to the explicit formulation of whether increases in degree consisted in an addition of parts, because thirteenth century philosophers interpreted “augmentation” through Aristotle’s concept of “auxesis.” Auxesis, Solère notes, requires divisibility into parts. The suggestion that the intensification of charity was also due to augmentation, in this sense, became the dominant Franciscan theory (583–585). See also Maier, *Das Problem der intensiven Größe*, 13–15. Augustine’s own distinction between the *quantitas molis*—the quantity of bulk—and the *quantitas virtutis sive perfectionis*, the quantity of perfection, was also important for medieval discussions of intensive magnitude. See *De trinitate* 6.7, cited by Maier, *Das Problem der intensiven Größe*, 11, as well as *De quantitate animae*, CCSL 50, ed. William J. Mountain and François Glorie (Turnhout: Brepols, 1968), cited by Anne Ashley Davenport, *Measure of a Different Greatness: The Intensive Infinite, 1250–1650* (Leiden: Brill, 1999), xi. As Davenport notes, Augustine’s “own paradigmatic example of an intensive quantity is the ‘amount’ of symmetry possessed by a geometric figure: thus a square ... possesses more symmetry than a triangle, and a circle than a square, and an indivisible point than a circle” (xi). Augustine’s distinction is the source for the medieval doctrine of God as the “qualitative infinite.” See Davenport’s study for the history of the “intensive infinite,” as well as Pierre Duhem’s classic study of infinities in the middle ages in *Medieval Cosmology: Theories of Infinity, Place, Time, Void, and the Plurality of Worlds*, ed. and trans. Roger Ariew (Chicago: University of Chicago Press, 1985), 3–136.

³¹ Maier, *Das Problem der intensiven Größe*, 49.

part of the new, higher degree of the quality.³² On the other hand, Walter Burley advocated the “succession theory” according to which each form—conceived of as possessing a particular degree—is destroyed in intensification and remission and replaced by a new form with the corresponding degree.³³ These two theories differ in answering the question of *how* intensification and remission occurs, but both provide a common answer to the *secundum quid* question. According to both theories, qualities themselves possess degrees. The subject instantiates a quality of a particular degree and then another, but the subject’s participation in bearing the quality is all or nothing. Furthermore, qualities do not change in degree. Rather, there are as many qualities as there are degrees. According to the additive theory, in intensification, the first quality is preserved as a part of the more intense quality; while, according to the succession theory, the first degree-quality is destroyed.³⁴

Thomas Aquinas formulates an important challenge to additive theories of intensification: only distinct things can be added to one another, but two things are either numerically distinct or belong to different species. One degree of a quality, however, cannot be numerically distinct from another, because numerical distinctness pertains only to subjects, but they also cannot differ in species—essence—because they are both degree

³² See Maier, *Das Problem der intensiven Größe*, 65: “Wilhelm von Ockham und seine Nachfolger halten sich an die scotistische Interpretation der intensio und remissio, wenigstens in den Hauptzügen: sie fassen die Intensio als eine additive Vermehrung, die das Charakteristikum aufweist, daß die ursprüngliche und die hinzukommende Realität von sich aus eine Einheit bilden. Das unum fieri wird also in die Definition der Intension aufgenommen und als ihr wesentlichstes Moment angesehen.”

³³ See Sylla, “Medieval Concepts of the Latitude of Forms,” 230–231 for this taxonomy.

³⁴ See Sylla, “Medieval Concepts of the Latitude of Forms,” 231.

instances of the *same* quality.³⁵ Therefore, one degree of a quality cannot be distinct from another, so a quality of one degree cannot be added to the subsequent degree. The basic mistake made by additive theories, Aquinas alleges, lies in their surreptitiously starting from a “false image” of intensification, taken from the combination of bodies.³⁶ The additive theory depends upon the existence of parts of qualities, but there is no way to individuate the parts of a quality—they are of the same kind and exist in the same subject.

In contrast to both the additive and successive theories, Aquinas interprets intensification as the actualization of a potential. Forms are actualized when they are instantiated to the degree to which their subjects are capable.³⁷ Aquinas draws here on a passage from Book IV of Aristotle’s *Physics*, important to Averroes’s commentary on the problem of *intensio*. According to Aristotle’s suggestion, the intensification of an existing quality obeys the same principle as the acquisition of a new quality: just as a non-warm thing becomes warm by actualizing a potential within it for warmth, so too does a warm thing become warmer by actualizing its potential.³⁸ While the details of Aquinas’s own position are complex—and, as commentators remark, ambiguous—his account of intensification as the actualization of a potential was the central alternative to the

³⁵ See Solère, “The Question of Intensive Magnitudes,” 585–586. As he notes, Aquinas specifically formulates this objection to additive accounts of charity, but the objection holds for all intensive magnitudes.

³⁶ Solère, “The Question of Intensive Magnitudes,” 586.

³⁷ See Solère’s discussion: “... participation is interpreted by Thomas in terms of the Aristotelian distinction between act and potency. According to him, such a form, if it could exist as separate, would be in its maximum actuality. When received in a subject, however, it enters into a composition with the potency of this subject, which more or less limits its full actuality. In other words, the relation of participation between a qualitative form and subjects admits of different degrees according to the capacity of the latter to receive the form’s perfection.” “The Question of Intensive Magnitudes,” 586.

³⁸ See Maier, *Das Problem der intensiven Größe*, 8–9 and 22.

Franciscan account. Furthermore, it remained the main target for attacks from the side of the dominant additive account through the sixteenth and seventeenth centuries.³⁹ Suarez, among others, considers and rejects a variety of Thomist theories, arguing that none can account for the growth in the subject's participation in the quality: if the change is not due to some "latitude" within the form itself, then what could this latitude consist in? But if the subject's participation in the form does not depend on anything about the quality itself, then there seems to be no reason at all why some qualities admit of a more and less, while others do not.

Suarez begins his argument for an additive theory by asking whether qualitative forms are divisible into parts or not and claims that only theories that affirm divisibility are capable of accounting for intensification and remission. He seems to endorse the premise that if a qualitative form is not divisible into parts, then it is unchanging—he does not consider the possibility that a qualitative form could change in some other manner than by addition of parts. If the form is unchanging, however, then the degree of the quality must be due to something within the subject instantiating it. But it is mysterious, he claims, what there could be in different subjects—or in the same subject at different times—that could account for an indivisible form's being instantiated to a different degree. This argument seems unlikely to convince Thomists, since they might respond that potentiality is a fundamental property of substances—it is involved in all sorts of explanations of change, according to the Aristotelian model, and follows from the

³⁹ Solère describes this ambiguity as follows: "Although he ascribes variation to participation only, he maintains that one must speak of intensification, or qualitative augmentation, with respect to the essence ('secundum essentiam,' or 'essentialiter') of qualities. He even on occasion speaks of latitude (in virtue)." "The Question of Intensive Magnitudes," 586.

substance's own essence. The relation of participation in a quality according to the degree of the substance's capacity is no more mysterious than any other relation of actualization. Suarez, however, concludes that one must endorse the divisibility of qualitative form into parts: the range of parts that can be instantiated is the quality's "latitude," a term Suarez adopts from the Oxford Calculators. These parts stand in an intrinsic relation of order—one necessarily comes after the next—and possessing a part at a particular position in the sequence entails possessing all of the parts prior to it within the sequence. In other words, for a sequence k_1, \dots, k_n , if a substance instantiates k_n , it must simultaneously instantiate k_1, \dots, k_{n-1} . Suarez turns, however, to an account of the actualization of a potential to explain what is added when a new part of the quality augments the previous degree. The new part can only have existed potentially prior to its addition, since otherwise it would have had to exist either in the previous degree, which would be contrary to the hypothesis, or it would have to have existed in another subject, in which case an accident would pass from one subject to another. Since accidents cannot pass from one subject to another, the additional part must only exist potentially before it is instantiated. The greater degree must be "extracted" from the form in order for aggregation to occur. Unlike Thomist theories that ascribe potentiality to the subject in which the quality inheres, however, Suarez holds that intensification is a real addition, because the new part is extracted from the form and thereby added to the subject in which it inheres. Suarez then considers difficulties concerning the continuity of intensification. He endorses the claim that intensification is continuous—adopting the Aristotelian strategy of distinguishing between potential and actual divisions—but is faced with the problem of

accounting for the initial acquisition of a quality: is this beginning itself continuous or is there a minimal degree of the intensity of a quality? Contrary to Aristotle, Suarez claims that there is a “first intensity”—which he calls an *initium qualitatis*. But this first part itself arises out of “an ultimate non-being.” This derivation of the initially instantiated quality from ultimate non-being seems, however, to violate the continuity of intensity.⁴⁰

Despite the differences among these theories and the complex solutions they introduce to deal with puzzles of continuity, it seems that none is able to resolve this question fully—to find an exit, in Leibniz’s terms, from the labyrinth of the continuum. Indeed, it is commonly held that this problem can only be solved on the basis of Newtonian physics.⁴¹ According to this story, the post-Leibnizian German rationalist Christian Wolff might be considered to be the first to employ the resources of the infinitesimal calculus to solve these concerns regarding continuity. In his *Philosophia prima sive ontologia*, Wolff claims that intensive magnitudes are “degrees” of qualities; they are not actually composed of independently existing parts but are “imaginary” beings, like the infinitesimals used by mathematicians in the calculus. Wolff’s solution here thus

⁴⁰ For a more thorough consideration of the problems of continuity and Suarez’s responses to them, see Solère, “The Question of Intensive Magnitudes,” 592–601. Suarez’s theory is only one of several seventeenth-century accounts of intensification. Solère considers three other accounts: those of Francisco Toledo, Rodrigo de Arriaga, and Silvestro Mauro.

⁴¹ See, for instance, Solère, “The Question of Intensive Magnitudes,” 607–608, for a presentation of this view: “Ancient thought, then, runs into a problem that modern physics will be able to solve only on a new basis and with new tools: how to create continuity from discontinuity? ... When Christian Wolff, in his *Ontologia*, reexamines the question of intensification and remission in light of the modern theories, he avoids both difficulties [of potential and actual instants].” Contrary to Solère, I shall argue that Leibniz’s solution is important not only because it uses new mathematical tools but because of the metaphysical theories that he is developing alongside these mathematical, physical, and logical innovations. One of the goals of the following study will be to demonstrate the interdependence of these reflections for Leibniz. For Wolff’s doctrine on intensities, see Christian Wolff, *Ontologia*, in *Gesammelte Werke*, ed. Jean École et al. (Hildesheim: Olms, 1962–), I/2, §757.

reflects Leibniz's account of infinitesimals as "well-grounded fictions" and uses these fictions to provide an answer to the question of the composition of a qualitative form that avoids both of Suarez's alternatives. But whereas Wolff simply applies an element of Leibnizian thought to the old problem of the intensification and remission of forms, Leibniz, I shall argue, transforms the very problem by providing a new foundation for the metaphysics of intensity.

The first chapter argues that Leibniz provides a new account of the individuation of substances on the basis of their intensive magnitudes. This thesis relies on two Leibnizian claims: first, everything real must be grounded in unities, and, second, these unities must have intrinsic principles of activity. In the first section of the chapter, I argue that these two principles entail that the principle of the individuation of substances is the degree of their primitive active force. To reconstruct this argument, one must examine Leibniz's reasons for holding that reality must be grounded in unities with activity. These derive, I claim, from two sets of considerations: his solution to the problems of the "labyrinth of the continuum" and the infinite divisibility of matter, on the one hand, and his arguments concerning the nature of substantial being, on the other. Many of Leibniz's initially puzzling claims regarding substances can be understood against the backdrop of his account of continuity. In the first section of the chapter, I argue for the thesis that intensive magnitude provides the principle of individuation. I focus on Leibniz's 1695 *Système nouveau de la nature et de la communication des substances*. There are three stages in this account. The first establishes that extension must be grounded in non-extended unities, on the basis of considerations regarding the relationship between parts and wholes

(§1.1). The second demonstrates why these non-extended unities must have intrinsic principles of activity (§1.2). And the third argues that these unities are individuated by their principles of intensity because their activity consists in representing the entire world (§1.3). §1.4 addresses an objection to Leibniz's account of monadic activity, based on concerns regarding its compatibility with his solution to the labyrinth of the continuum, while §1.5 introduces a parallel between appetitions and infinitesimals. The second main section turns to Leibniz's reply to the skeptic Simon Foucher's objections to the *New System*. In his response to Foucher, Leibniz clarifies the connection between his solution to the labyrinth of the continuum and his account of non-extended unities individuated by primitive active forces.

After establishing the role of intensity in Leibniz's metaphysics of substance in the first chapter, I turn, in the second, to a consideration of Leibniz's law of continuity—the principle that nature never makes leaps. Chapter 2 focuses on the continuum of perceptions and the continuum of perfections. These two continua constitute the most basic application of Leibniz's law of continuity to his metaphysics of substance. The concepts of perfection and of perception are, I argue, closely linked: perfection is the degree of unification of the many within the one, while perceptions are complex wholes structurally identical to that which they represent. The first section of the chapter considers Leibniz's law of continuity and establishes that Leibniz's different formulations and applications of this law all follow from a single principle derived from an account of God's wisdom. I then reconstruct the relation of expression on the basis of this principle of perfection. This account of perfection and perception allows us to return to the

questions concerning *petites perceptions* raised by Leibniz's remarks in the Preface to the *New Essays*. §2.2 develops four aspects of Leibniz's theory of *petites perceptions* and explains the sense in which they "compose" the perceptual continuum. The magnitude of perceptions, as we have seen, must be intensive: perceptions have degrees of strength. Thus, Leibniz's solution to the composition of the perceptual continuum also explains his theory of intensive magnitude as a unity of degrees. The section concludes by reconnecting this account to the status of the *je ne sais quoi*. §§2.3–2.4 consider Leibniz's accounts of intensification—the tendency of certain states towards increasing their level of activity—and of remission. I then introduce the idea of God as a qualitative activity; while in the fifth and concluding section, I consider the ontological status of primary matter. The limitations of finite creatures do not result, I argue, from a separate ontological principle but can be explained on the basis of their very principles of individuation.

Chapter Two concludes the discussion of the role of intensity in Leibniz. From here I turn to Kant's reconsideration of intensity in the *Critique of Pure Reason*. Kant's claim that cognition involves the contribution of two faculties, sensibility and the understanding, is commonly seen as a decisive rejection of Leibnizian metaphysics. Cognition, Kant argues, requires that an object be given to the subject in intuition. Sensibility is not a confused form of the understanding but instead accounts for this givenness of objects. Sensibility and the understanding provide distinct contributions to human cognition. Sensibility itself has both a formal and a material aspect: objects are only given to us through the forms of our intuition, space and time. The principle of

intensive magnitudes, introduced in a short section of the *Critique of Pure Reason* entitled the Anticipations of Perception, suggests, however, that the understanding can determine something a priori about the very matter of our perceptions. According to this principle, we know a priori that sensation—or the “real” corresponding to it—has a degree or intensive magnitude. This principle presents a puzzle for explaining the relationship between thought and the given: how can the understanding prescribe something regarding what can merely be given? Chapter Three reconstructs Kant’s theory of intensive magnitude and offers a solution to this problem, based on Kant’s account of a priori synthesis in the Schematism. The first section examines the relationship between Kant’s and Leibniz’s accounts of force through an interpretation of Kant’s criticisms of Leibniz in the concluding section of the Transcendental Analytic, the Amphiboly of Concepts of Reflection. Kant’s arguments against Leibniz demonstrate a surprising consequence concerning the relations among three pairs of concepts—unity and multiplicity, matter and form, and reality and negation. Considered in relation to sensibility, the conceptual priority among these notions is reversed: in a particular sense, multiplicity assumes priority over unity, form over matter, and negation over reality. Sections Two and Three explore the historical genesis of this surprising reversal, starting from a brief Reflection from the early 1770s. Kant’s discussion in this essay relies, in turn, upon the distinction between logical and real opposition introduced in his 1763 essay on Negative Magnitudes. Kant’s theory of real opposition, however, provides the key to understanding the basis for his account of the a priori synthesis of intensity, introduced in the Schematism and Anticipations. The fourth and final section of the chapter

reconstructs Kant's argument for the principle of intensive magnitudes on the basis of this account of real opposition. I argue that Kant's theory of temporal determination provides a justification for the principle of intensive magnitudes, but that this theory raises a fundamental question regarding the status of the instant.

The concluding chapter turns to the question left open at the end of the third chapter concerning the simplicity of representations in a single instant. In the first *Critique*, Kant seems to claim both that absolutely simple representations are contained in each instant of time and that the reality present in a single instant is capable of variation and thus implicitly contains a multiplicity. This problem regarding the "filling" of an instant articulates the fundamental tension regarding intensive magnitudes: it is the question of how there can be a unity that "implicitly" contains a multiplicity. I argue that this problem arises from a misconstrual of Kant's theory of time. The instant, for Kant, is not a constituent of time but only its limit. Once this theory of temporal limitation is taken into account, the apparent tension in Kant's theory can be resolved. In his 1790 *Critique of Judgment*, however, Kant returns to the question of the simplicity of the instant, providing a new account of the instant not as a constituent of objective cognition but as arising from a *feeling* of limitation. Kant provides this new theory of the instant in the *Analytic of the Sublime*. Kant's argument here is closely connected, I claim, to his account of intensive magnitude. The first section reconstructs Kant's account of aesthetic measure and shows that this measure must have an intensive magnitude. In the second section, I return to the question of the simplicity of instant through an examination of the syntheses of apprehension and comprehension in both the A edition of the Deduction in

the first *Critique* and in the *Analytic of the Sublime*. The treatment of comprehension in the third *Critique* provides the basis for Kant's account of the *Augenblick* as a felt limit to temporal synthesis. The third and final section of the chapter introduces a parallel between Kant's theory of the *Augenblick* and infinite judgment. Examining the relationship between infinite judgment and the felt *Augenblick* shows the way in which intensity functions as a fundamental principle both of the understanding and of reflective judgment. Kant's theory of intensity, I claim, can only be understood on the basis of a continuity of concerns between his theoretical philosophy and his account of the principles of judgment.

Chapter 1:

The Role of Intensity in Leibniz's Theory of Substance

Gottfried Wilhelm Leibniz first addressed the question of the individuation of substances in the *Disputatio metaphysica de principio individui*, composed when he was seventeen.¹ In this early text, Leibniz argues that it is the *entitas tota* that makes each individual the very individual that it is. The “whole entity” doctrine claims, roughly, that all of the “components” of a being are required to individuate that being; it is neutral as to what these components are and whether they are one or many.² Following this treatise, Leibniz moved on to consider juridical antinomies, jurisprudential pedagogy, and the question of who should be king of Poland. But his interest in the individuation of substances

¹ For a brief account of the biographical context of the *Disputatio*, see Benson Mates, *The Philosophy of Leibniz: Language and Metaphysics* (Oxford: Oxford University Press, 1986), 17–18. According to Mates, Leibniz held the whole-entity view for the entirety of his life (7). For a discussion of this text in the context of Leibniz's intellectual development, see Maria Rosa Antognazza, *Leibniz: An Intellectual Biography* (Cambridge: Cambridge University Press, 2009), 57–59. As Antognazza points out, Leibniz's advisor, Jacob Thomasius, wrote a preface to Leibniz's *Disputatio* in which Thomasius characterized two kinds of Aristotelian individuals: “sporadic individuals” and “monadic individuals.” Each individual of the latter sort forms a species, while many of the former could all belong to the same species. Antognazza notes this connection to Leibniz's later “monadological metaphysics” and cites Leibniz's own characterization of “his doctrine of individual substance as an extension of Aquinas's teaching regarding angels: from a metaphysical point of view each individual constitutes a species” (57).

² See J.A. Cover and John O'Leary-Hawthorne, *Substance and Individuation in Leibniz* (Cambridge: Cambridge University Press, 1999), 40–44. As they argue, in the *Disputatio*, the components have to be intrinsic properties of the substance, so “accidental accoutrements” are not relevant for individuation. The point of debate between the whole-entity and the less-than-whole entity views concerns whether *all* of the “genuinely internal” properties of a thing are required to individuate it: “The approach Leibniz is keen to reject in the *Disputatio* is the view that, among the non-accidental components of a thing, only a subset of them need be invoked in order to explain Socrates' individuality” (40–41). For a thorough discussion of the *Disputatio* and of Leibniz's continued concern with the problem of individuation, see Lawrence McCullough, *Leibniz on Individuals and Individuation* (Dordrecht: Kluwer, 1996). As Massimo Mugnai notes in “Leibniz on Individuation: From the Early Years to the ‘Discourse’ and Beyond,” *Studia Leibnitiana* 33 (2001): 36–54, Leibniz's adherence to the whole entity doctrine attests to his moderate nominalism.

remained, shaping his so-called “monadological metaphysics”—his view that at the most “fundamental level” there are an infinity of causally isolated simple substances endowed with perceptions and appetitions that “represent” the entirety of the universe from their own perspectives.³ This theory—and the array of doctrines connected to it, including preestablished harmony and panpsychism—has so perplexed scholars that Vincenzo de Risi begins his recent monograph on Leibniz by conceding that “Leibniz’s thought may first appear as a *fantastic fairy tale* or an enthralling and imaginative *metaphysischer Roman*.” He notes that while this “disconcertment” has become a “commonplace[,] ... this same

³ Leibniz most famously presents the main tenets of this view in the opening paragraphs of the *Monadology*: “La monade, dont nous parlerons ici, n’est autre chose, qu’une substance simple, qui entre dans les composés; *simple*, c’est à dire, sans parties” (§1); “Il n’y a pas moyen aussi d’expliquer, comment une Monade puisse être altérée ou changée dans son interieur par quelque autre creature, puisqu’on n’y sauroit rien transposer ny concevoir en elle aucun mouvement interne, qui puisse être excité, dirigé, augmenté ou diminué là dedans, comme cela se peut dans les composés, où il y a du changement entre les parties. Les Monades n’ont point de fenêtres, par lesquelles quelque chose y puisse entrer ou sortir” (§7); “L’état passager qui enveloppe et represente une multitude dans l’unité ou dans la substance simple n’est autre chose que ce qu’on appelle la *Perception*” (§14), and “L’action du principe interne, qui fait le changement ou le passage d’une perception à une autre, peut être appelée *appetition*” (§15) (GP 6:607–609; AG 213–215). There has been much debate in recent literature whether Leibniz held a “monadological metaphysics” throughout his so-called “mature period,” from roughly 1686 through the end of his life, or whether he adopted the view at a later point. Indeed, there is even a question of whether at the time of the *Monadology* Leibniz adhered exclusively to this metaphysics or whether he sometimes adopted another view, called the “corporeal substance” theory. For a careful consideration of these issues, locating the origin of the “monadological metaphysics” in the 1690s, see Daniel Garber, *Leibniz: Body, Substance, Monad* (Oxford: Oxford University Press, 2009), particularly 303–349. I follow Garber in using the term “monadological metaphysics” for this cluster of views. For the classic account of Leibniz as an idealist and a defense of the centrality of his “monadological metaphysics,” see Robert Adams, *Leibniz: Determinist, Theist, Idealist* (Oxford: Oxford University Press, 1994), 217–307. In the opening sentences of chapter nine, Adams declares Leibniz’s monadological claim that things are constituted exclusively out of simple substances with perceptions and appetitions to be “the most fundamental principle of Leibniz’s metaphysics” (217). Adams considers it central to Leibniz’s position that bodies are “phenomena,” which he interprets as intentional objects. Indeed, he writes that, in his opinion, “Leibniz’s phenomenalism is a forerunner of the phenomenalism of Kant” (219). Further, “For present purposes, bodies, as phenomena, may be thought of as the objects of a story—a story told or approximated by perception, common sense, and science. In calling them phenomena Leibniz means that they have their being in perceptions that represent this story to perceiving beings” (219).

philosophical criticism endeavors to show that, at least at second sight, Leibniz's own desultory and fantastic exposition of metaphysics lends itself to arrangement into a consistent, perhaps verisimilar, and in any case not airy-fairy framework."⁴ This sense of bewilderment has presented a challenge to scholarly attempts at rational reconstruction, spawning a critical literature nearly as vast and various as the texts within Leibniz's own corpus. The scholarship devoted just to Leibniz's account of substance is enormous. Yet, I will argue that, for all the attention paid to this theory of substance, a concept central to understanding Leibniz's arguments for his monadological metaphysics has been largely ignored—the concept of intensity.

Leibniz himself does not discuss intensity by name at any length—although he frequently mentions the related notion of change of degree, as we have seen from the passage from the Preface to the *New Essays* briefly discussed in the Introduction. In a 1677 letter to the Cartesian philosopher Arnold Eckhard, however, Leibniz does provide a brief definition of intensity and relates it to the concepts of perfection and force. Leibniz responds here to a series of arguments offered by Eckhard, purporting to show that the concept of a most perfect being is free from contradiction.⁵ While Leibniz assigns the

⁴ Vincenzo de Risi, *Geometry and Monadology: Leibniz's "Analysis Situs" and Geometry of Space* (Basel: Birkhäuser, 2007), ix.

⁵ L 177; GP 1:266–270. The core of Leibniz's response to Eckhard consists in comparing the concept of "maximum of perfection" to "maximum velocity." Eckhard's arguments, Leibniz alleges, would apply equally well to "maximum velocity," which we know to be contradictory. If the non-contradictoriness of "maximum perfection" is to be established, it must be by arguments that fail to apply to velocity. This suggests that the success of the ontological argument, for Leibniz, rests on establishing a distinction among different types of quantities or degrees of quality: those that admit a maximum and those for which a maximum implies a contradiction. Leibniz also accuses Eckhard of assuming without argument that all beings are either mind or matter, simply because we are not familiar with any other type of being. Since, Eckhard writes, no being *per se* is material, and the most most perfect being must be *per se*, the most perfect being must be a mind. Leibniz criticizes Eckhard's reasoning here, because the most perfect being might be

highest importance to this task and offers a proof of his own in other texts, he finds Eckhard's arguments unsatisfactory. Although the details of this dispute are not of concern here, the letter is important as one of the rare passages in which Leibniz uses the term "intensity."⁶ He writes: "Several of my objections have ended since you have explained that in your usage, perfection is being insofar as it is understood to differ from nonbeing, or, as I should prefer to define it, *perfection* is degree or quantity of reality or essence, as *intensity* is degree of quality, and *force* is degree of action" (L 177).⁷ He thus distinguishes three types of degree based on that of which they are the amount. Intensity is limited to more or less of a quality. This definition seems to cast in doubt the proposal that intensity is the individuating principle of substances, because the proposal would apply the concept of intensity to forms of gradation that would be better captured, in

something other than mind or matter. Kant makes the very same charge against Leibniz in the Amphiboly to the *Critique of Pure Reason*, alleging that Leibniz simply takes as obvious that our minds provide the model of simple substance. The fact that Leibniz already charges Eckhard with this error should cast doubt on the fairness of Kant's pinning the mistake on Leibniz.

⁶ In addition to this letter, see also his 1667 (revised in 1697–1700) treatise, *A New Method for Learning and Teaching Jurisprudence* (AA 6.1.259–364, partially translated in L 85–92). In his discussion of methods of teaching, Leibniz claims that teaching is the form of "natural practice" by which sentient beings acquire a habit. He distinguishes two types of "impressive action." Habits are acquired "by means of the quantity of impressive action. But quantity is either extensive or intensive; extensive quantity consists in the *number of actions*, intensive in the *magnitude* or the strength required to impress the habit. The earlier requirement is popularly recognized when people say that habit is built by frequent actions; on the latter people are usually cited" (§10, L 86, AA 6.1.271). Several paragraphs later he writes: "we proceed to intensity or *magnitude*. One act carried out with a distinctive force of impression often accomplishes more than many repetitions. For example, we easily remember unusual facts, unexpected jokes, and acts that are uniquely related to our own interest, such as those which bring us praise or blame. ... It is best, however, to mix frequency with magnitude. This happens especially when action begins with the smallest and is increased continuously and by degrees until it reaches a maximum" (§14, L 87, AA 6.1.273). Leibniz's use of "intensity" to describe all sorts of differences in magnitude, including the magnitude of force, calls into question the stringency of the taxonomy he proposes in the letter to Eckhard. Furthermore, it is instructive to see how Leibniz's interest in the gradations of sensation and quality, crucial to the *New Essays*, is already present in this early text.

⁷ "Postquam explicuisti, perfectionem tibi esse Entitatem, in quantum a non entitate recedere intelligitur, vel, ut ego definire malem, *perfectionem* esse gradum seu quantitatem realitatis seu essentiae, ut *intensio* gradus qualitatis et *vis* gradus actionis" (GP 1:266).

Leibniz's terminology, as perfections or as forces. This objection, however, rests on a superficial feature of the passage and ignores the historical purchase of Leibniz's reintroduction of intensity.

Originally formulated in scholasticism to describe the nature of qualitative change, the concept of intensity fell into disrepute with Descartes's argument that matter is defined by its extension. In the letter to Eckhard, Leibniz is thus revising a narrowly-defined scholastic term in order to stage a confrontation with Cartesians who offer, in Leibniz's view, facile metaphysical reductions that ignore worthwhile scholastic distinctions. While Leibniz thus tactically deploys a limited scholastic concept of intensity here, in his own metaphysics, he develops a more general, unified, and powerful conception of degree. Far more important than Leibniz's differentiation among forms of graduation is his description of being, action, and quality as all possessing degrees. In addition to this suggestion of a common category of degree, Leibniz's mature philosophical commitments suggest that these three nominally different types of degree are really one, for what constitutes the *being* of a substance is its principle of activity, and this principle is the law-of-the-series determining qualitative states. What individuates the substance is its *whole* being, not a component of the being, as Leibniz had already argued in the *Disputatio*.⁸ This suggests that the common property of possessing degree is an essential aspect of what metaphysically fundamental to substances. I shall use the term

⁸ For an excellent philosophical account of this early text and its relation to the scholastics, as well as an argument for its importance in understanding Leibniz's later positions regarding the individuation of substances, see Cover and O'Leary-Hawthorne, *Substance and Individuation*, 1–57. Daniel Garber has recently challenged the claim for the importance of the whole-entity view, arguing that Leibniz quickly abandoned the position he adopts in this youthful text. See his *Leibniz: Body, Substance, Monad*, 55–62. For a thorough defense of the whole-entity view, see Cover and O'Leary-Hawthorne, *Substance and Individuation*, chs. 1 and 5.

“intensity” as a name for this phenomenon of degree, because it is the contrary of extension, and Leibniz often—as, for instance, in the *New Essays* passage—uses what “differs in degree” in contradistinction to what differs in extensive magnitude.

The present chapter argues that this concept is implicit in his account of the nature of substance. While it is a familiar Leibnizian doctrine that, for substances to be distinct, they must differ in their qualitative properties—in accordance with the famous Principle of the Identity of Indiscernibles—this doctrine has not been considered in relation to the *quantity* of these qualities. The *degree* of quality plays a crucial role in explaining what makes a substance *one* and what makes a substance the very substance that it is—what makes it an individual. In the following, I will delineate the most important features of this concept of intensity in order to shed light on some of the most difficult aspects of Leibniz’s theory of substance. Indeed, my aim will be to offer a new account of Leibniz’s theory of substance—as well as of the philosophical concerns this theory is addressing—by defining the concept of intensive magnitude and showing how this idea stands at the center of many of Leibniz’s central doctrines. Reconstructing this concept will also show how some of the diverse strands of Leibniz’s metaphysics are related. In particular, I wish to claim that simple substances are individuated by the different intensive magnitudes of primitive active force that they possess.

Leibniz is the first philosopher of the early modern period to develop an account of force as a fundamental feature of the world and to conceive of force as possessing intensive magnitude. Leibniz adheres to the scholastic view that the extensive properties of phenomena are grounded in the qualities of substances. These qualities, in turn, are

derivative upon forces with a specific degree or intensity. Force, for Leibniz, consists in a certain strength of activity that forms the basis for changes in the world of extension. I will consider some of Leibniz's arguments for this view and develop its connections to his conception of the activity of substances as consisting in the law-of-the-series determining perceptual states. Since all properties of a substance are grounded in these perceptual states, which must represent everything in the universe, each substance's individuating principle, its law-of-the-series, determines its degree of perceptual activity. This project brings together two problems usually considered in isolation: first, the set of questions concerning the nature of Leibnizian substances, and, second, a range of issues concerning the infinite divisibility of matter and the so-called "labyrinth of the continuum." The latter group of problems provides motivation for Leibniz's ontology of simple substances with differing degrees of perceptual activity.

Leibniz develops his account of force in response to a puzzle concerning unities and multiplicities.⁹ This puzzle is a version of a problem much debated in early

⁹ Throughout this introductory section, I use the terms "unity" and "simple" interchangeably to indicate something metaphysically indivisible. Mixing these terms is controversial, however, because a something's *having* a unity (for instance a substantial form) does not necessarily imply that the substance itself is simple. Samuel Levey, for instance, has claimed that during most of his so-called "middle period," Leibniz endorsed a doctrine of "incorporeal forms as principles of unity." "On Unity and Simple Substance in Leibniz," *The Leibniz Review*, 17 (2007): 61–106 at 85. Levey attempts to show that Leibniz's arguments concerning unity and multiplicity only establish that there must be *some* unity (and incorporeal form) in every substance and not the stronger thesis that substances must themselves be simple. In Levey's view, Leibniz's claims in *The Monadology* are not justified and should not be taken to represent Leibniz's well-considered position. See also Samuel Levey, "On Unity: Leibniz—Arnauld Revisited," *Philosophical Topics* 31 (2003): 245–275. In my view, Cover and O'Leary-Hawthorne present compelling reasons why Leibniz was entitled to argue from a principle of unity to simple substances: the *entitas tota* account of the individuation of substance. While I cannot defend this at length here, the idea is that since what individuates a substance must be its whole being, and unity is the principle of individuation, unity cannot be a "component" of substance. Instead, the substance itself must be simple. My arguments concerning intensity do not rely on accepting this position, however. The

philosophy concerning the constitution of matter—whether or not matter was infinitely divisible—and stems from a conflict between the infinite divisibility of space, required for analytic geometry, and the metaphysical thesis that absolute unities underlie all multiplicities.¹⁰ He starts from the premise that the reality of the multiple must derive from that of the unit. But then extension cannot be the foundation of reality, because it is, in its essence, multiple: it is divisible into parts that are themselves made of parts, and this process can be repeated ad infinitum. A smallest “unit” of extension is impossible because this unit would not have parts. Since extension cannot be fundamental, it must either be grounded in something fundamental or simply be illusory. If it is not merely illusory, it must be grounded in something (since it is not itself simple), but this relation of grounding is not mereological: matter is grounded in a unity in an utterly different manner from the way in which a whole depends upon its parts. This suggests why Leibniz claims that extended beings depend upon unities that have intensity: only a unity with an intensive magnitude—where the unity is ontologically prior to the many not as a

distinction between unity and simplicity is also essential for Garber’s reading of the evolution of Leibniz’s views. Unlike Levey, Garber considers Leibniz’s argument from unity to simplicity to be compelling: Garber, however, does not think that Leibniz had fully understood the consequences of the argument before the late 1690s or early 1700s. See *Leibniz: Body, Substance, Monad*, 344–345. In addition to the pressures of the unity argument, Garber sketches another possible reason Leibniz might have developed the metaphysics of the monadology: the need to secure a place for primary matter (345–349). I shall return to these considerations in Chapter 2.

¹⁰ In his *The Architecture of Matter: Galileo to Kant* (Oxford: Oxford University Press, 2005), Thomas Holden provides a helpful survey of this debate in the early modern period and offers an extensive taxonomy of the paradoxes and their proposed solutions. Holden’s own construction of this problem in terms of a conflict between the “actual parts doctrine,” according to which all parts of a whole are “each concrete existents in their own right” (3), and infinite divisibility echoes, as Holden states, Kant’s own description of the controversy in his early *Physical Monadology* (Ak. 1:473). Holden takes Kant’s metaphor for this difficulty—mating griffins with horses—as the title of the first chapter of his book. In the present account, I combine mereological considerations concerning part/whole relations with claims about unity and multiplicity. Leibniz’s solution to his puzzle will eventually turn on distinguishing these pairs of oppositions more carefully than in the initial statement of the problem.

homogenous part but as a *one* in virtue of which the many can exist—can secure the *reality* of extended substances.¹¹ For a unity to possess an intensive magnitude means for it to have a relation to the many that is completely different from that of element to composite. Thus, Leibniz’s solution to this puzzle is to develop a theory of non-extended unities of force, simples that have a degree of strength.¹² While these unities are simple,

¹¹ Spinoza can be seen as offering another solution to the problem of the relation of the one to the many by making the whole ontologically primary and thus asserting that there is only one substance. See *Ethics* 1P13: “Substantia absolute infinita est indivisibilis” and its Scholium: “Quod substantia sit indivisibilis, simplicius ex hoc solo intelligitur quod natura substantiae non potest concipi nisi infinita et quod per partem substantiae nihil aliud intelligi potest quam substantia finita, quod (per propositionem 8) manifestam contradictionem implicat” and 1P14. If only the one is truly real, then the problem is dissolved. But Leibniz resisted Spinoza’s solution. While Leibniz attempts to provide separate arguments for the existence of multiple substances, many commentators have viewed his attempts to skirt Spinoza’s monism with just as much skepticism as his efforts to avoid (perceived) Spinozistic necessitarianism. In *A Critical Exposition of the Philosophy of Leibniz* (London: Routledge, 1992), 59, Bertrand Russell famously wrote that Leibniz’s law of the Identity of Indiscernibles should have committed him to the existence of just one substance. Cover and O’Leary-Hawthorne provide an extensive discussion of the threat of monism in the final chapter of their *Substance and Individuation*, 253–290, concluding that Russell’s charge is largely justified and that Leibniz fails to argue convincingly against Spinoza. Spinoza’s solution is, of course, not the only competitor to Leibniz, even if avoiding Spinozism loomed largest for Leibniz. See again Holden’s taxonomy of the different solutions offered by early modern philosophers—including Arnauld, Malebranche, Hume, Bayle, Locke, Newton, Clarke, Berkeley, Euler, Boscovich, and Reid—to the set of puzzles concerning the divisibility of matter. *The Architecture of Matter*, 50–72. Holden provides the just-mentioned partial list of philosophers who addressed these issues in *Architecture of Matter*, 6.

¹² One question here is whether this argument is compatible with the metaphysical picture that Garber terms the “corporeal substance” account. Garber writes: “While corporeal substances are genuine unities and genuinely indivisible for Leibniz, they are not simple and without parts: they are composed of corporeal substances smaller still, to infinity. And insofar as corporeal substances are the basic unities of which the world is composed at the most basic metaphysical level, there is no bottom level of substances in the world, no metaphysical level that is the ultimate foundation of reality.” *Leibniz: Body, Substance, Monad*, 316. Even though corporeal substances do not have a bottom layer of *constituents*, one might think that the corporeal substance might be *metaphysically* fundamental, in the sense of grounding its constituents. Recently, for instance, Jonathan Schaffer has argued for a substance-monism according to which the *entirety* of the world is fundamental. See his “Monism: The Priority of the Whole,” *Philosophical Review* 119 (2010): 31–76. If Leibniz held a view like this, he might think that corporeal substances are fundamental while not being simple. To my knowledge, however, Leibniz never considers such a position. I take the present argument to lead to the “monadological metaphysics,” rather than the corporeal substance account.

they are also wholes that contain the many implicitly. The concept of intensity allows us to understand the relation of implicit containment that Leibniz establishes between a non-extended unity and a multitude in terms of force, change, and activity.

Leibniz offers this argument for the reality of non-extended simple substances in a variety of texts from the late 1690s to the end of his life. From approximately 1698 onwards, Leibniz uses the term “monad” to designate these simples. In 1714, he makes them the centerpiece of his most famous philosophical essay, *The Principles of Philosophy, or the Monadology*, where he rehearses his argument concerning multiplicity and unity and concludes that monads are “les veritables Atomes de la Nature, et en un mot les Éléments des choses” (§3, GP 6:607).¹³ If, as I will argue, non-extended simples should be understood as intensive unities, then the concept of intensity also sheds light upon Leibniz’s notion of a monad. Identifying intensity as the fundamental characteristic of monads reveals the way in which Leibniz attempts to develop a philosophy based upon qualitative variation. This ought to be considered one of Leibniz’s main philosophical contributions: the development of a theory of substance as a unity of force. I will begin by examining one of the earliest texts in which Leibniz presents his argument concerning

¹³ The term “monad” is first found in Leibniz’s published writings in the 1698 essay, *On Nature Itself: Or, on the Inherent Force and Actions of Created Things, Toward Confirming and Illustrating Their Dynamics* (GP 4:504–416; AG 155–167). See *Monadology*, §3 (GP 6:607, AG 213). The first instance, contained in an unpublished text, is Leibniz’s 1695 letter to L’Hôpital, where he sets “monas” in apposition to “une unité réelle” (AA 3.6.451, cited in Garber, *Leibniz: Body, Substance, Monad*, 336). As we have seen, however, Leibniz’s use of it might be traced back to Thomasius’s distinction between “sporadic” and “monadic” individuals. See above note 1. See Garber, *Leibniz: Body, Substance, Monad*, 335–345 for a discussion of the history of this concept in Leibniz’s texts in the 1690s. As Garber argues, it is difficult to ascertain the precise meaning of the term in these first texts—in particular, whether Leibniz simply used “monad” as another term for “unity” or whether it designated only simple substances. The textual evidence prior to around 1700 seems to be equivocal.

unity and multiplicity, the *Système nouveau de la nature et de la communication des substances*, an essay introducing the philosophical public to his metaphysical views.¹⁴

1. Force and Unity in the *Système nouveau*

In 1695, Leibniz presented the readers of the *Journal des Sçavans* with a tour de force, a brief essay promising, as the title declares, a *Système nouveau de la nature et de la communication des substances*.¹⁵ Although the *Système* was the first published statement of his account of substances,¹⁶ Leibniz had, as he writes in the first paragraph, circulated a

¹⁴ Garber has questioned whether Leibniz is already committed, in the *Système nouveau*, to a model of non-extended simple substances as metaphysically primary or whether he holds that the fundamental building blocks of the world are extended, corporeal substances. Garber considers the *New System* to be at the threshold between what he identifies as Leibniz's "corporeal substance" view and his later "monadological metaphysics." Garber, *Leibniz: Body, Substance, Monad*, 321–335. In particular, he notes substantial differences among the drafts of the *New System* regarding this point. In the following section, I will claim that the arguments Leibniz provides in the *Système nouveau* commit him to a model of non-extended simple substances with intensive magnitudes, although it is not entirely clear that the texts must be read this way. Since my concern here is less with the development of Leibniz's positions than with reconstructing a specific concept, the danger of anachronism is not so great: what is important is to trace the outlines of Leibniz's conception of degrees of force. My discussion of the theory of intensity thus borrows from passages in later texts such as the *Monadology* or in his correspondence with the Baron de Volder in order to reconstruct the concept of intensity. For another discussion of the development of Leibniz's views focusing on the place of the *New System*, see Donald Rutherford, "Metaphysics: The Late Period," in Nicholas Jolley, ed., *The Cambridge Companion to Leibniz* (Cambridge: Cambridge University Press, 1995), 124–175.

¹⁵ I shall cite throughout to the final edition of the text, published as GP 4:477–487. As Garber notes, five versions of the essay have survived (*Leibniz: Body, Substance, Monad*, 324), though only two are available in published form, the first and the last. Gerhardt includes both of these. The latter includes Leibniz's post-publication emendations. While the differences among these versions are significant, I shall only consider the final edition as the most helpful for deciphering Leibniz's argument for unities possessing intensive magnitudes of force.

¹⁶ Leibniz had, in fact, published a short essay a year prior in the *Acta eruditorum* entitled "De primae philosophiae emendatione et de notione Substantiae." In this brief text, Leibniz announces the fruitfulness of his concept of force for explaining the nature of substance. While he does not develop this connection in the 1694 essay, he does offer the following instructive comparison between his own concept of force and the scholastic notion of power: "Active force differs from the mere power familiar to the Schools, for the active power or faculty of the scholastics is nothing but a close possibility of acting, which needs an external excitation or

number of papers among “sçavans hommes,” including the Jansenist philosopher, mathematician, and theologian, Antoine Arnauld. In 1686, Leibniz sent Arnauld “un petit discours de Metaphysique” (GP 2:11), as he described the piece in a letter to the Landgrave Ernst von Hessen-Reinfels, sketching his positions on the nature of substances and their interactions.¹⁷ In thirty-seven theses, Leibniz presents his central metaphysical doctrines concerning the perfection of the world, the non-interaction of substances, and the expression of the totality of the world by each individual substance.¹⁸ In the discourse for Arnauld, Leibniz presents his view that all substances possess “complete individual concepts” from which it would be possible to deduce all the properties the substance has ever had and will ever have.¹⁹ Since Leibniz derives his argument that individual

stimulus, as it were, to be transferred into action. Active force, in contrast, contains a certain act or entelechy and is thus midway between the faculty of acting and the act itself and involves a conatus. It is thus carried into action by itself and needs no help but only the removal of an impediment” (L 433; GP 4:469). He goes on to claim that all substances possess this power of acting and that therefore the essence of bodies is not to be found in extension. Earlier in the essay, Leibniz identifies Descartes (and the Cartesians) as his target: “It cannot be denied that Descartes has contributed some admirable things. ... But he missed the mark because of a certain wavering or a license in making assertions and failed to distinguish the certain from the uncertain. And so he absurdly put the nature of corporeal substance in extension” (L 432; GP 4:468–469).

¹⁷ Arnauld responded by criticizing Leibniz’s thesis in section thirteen of the *Discours* that “la notion d’une substance individuelle enferme une fois pour toutes tout ce qui luy peut jamais arriver” (GP 4:436). In this section, Leibniz argues that this conceptual containment does not imply that everything happens necessarily and, furthermore, in no way detracts from human freedom. In his response, Arnauld worries that despite Leibniz’s assurances, this doctrine makes everything that takes place necessary. This dispute over the modal and ethical consequences of “conceptual containment” led to the fruitful correspondence that Leibniz refers to in the *Système nouveau*. See GP 2:37–47, 73–78, 90–102.

¹⁸ See especially theses I, VIII, and IX–XIV, GP 4:427–428, 432–440.

¹⁹ The argument reads: “Or il est constant que tout predication veritable a quelque fondement dans la nature des choses, et lors qu’une proposition n’est pas identique, c’est à dire lors que le predicat n’est pas compris expressément dans le sujet, il faut qu’il y soit compris virtuellement, et c’est ce que les Philosophes appellent *in-esse*, en disant que le predicat *est dans* le sujet. Ainsi il faut que le terme du sujet enferme tousjours celui du predicat, en sorte que celui qui entendroit parfaitement la notion du sujet, jugeroit aussi que le predicat luy appartient. Cela estant, nous pouvons dire que la nature d’une substance individuelle ou d’un estre complet, est

substances must have complete individual concepts from the logical requirements of predication, it might seem that logical motivations underlie Leibniz's metaphysical commitments.²⁰ But Leibniz also offers arguments for his new view of substances that do not depend on his theory of complete individual concepts.

In the first paragraph of the *Système nouveau*, Leibniz says that both the positions he had advanced in his correspondence with Arnauld and the opinions articulated in the following text express the principles of a "system" he had devised "some years before." In the *Système nouveau*, Leibniz's strategy is to present a narrative of his discovery of this system centering on his realization that force must be the basic metaphysical concept underlying the laws of physics. Leibniz makes no mention in this text of complete individual concepts and omits all references to predication.²¹ Instead of motivating his system from considerations concerning the logic of concepts, he presents his view as stemming from his return to substantial forms, which, he maintains, are principles of

d'avoir une notion si accomplie qu'elle soit suffisante à comprendre et à en faire deduire tous les predicats du sujet à qui cette notion est attribuée" (GP 4:433).

²⁰ The commentaries of Louis Couturat and Bertrand Russell at the beginning of the 20th Century argue for the view that this logical argument provides the true basis for Leibniz's metaphysics. Russell writes, for instance: "The system, which he afterwards uniformly maintained, was completed, in all essentials, by the beginning of the year 1686. In his writing during this year, when the grounds of his new opinions were still freshly present to his mind, there occurs an argument of great importance, derived, as he himself says ... from the general nature of propositions, and capable, in his opinion, if the plurality of substances be admitted, of alone establishing the remainder of his system." *Philosophy of Leibniz*, 9. For Couturat's position, see, among other works, "Sur la métaphysique de Leibniz," *Revue de Métaphysique et de Morale*, 10 (1902): 1–25.

²¹ This may be because of Leibniz's habit, as Russell argues "of choosing the reasons most likely to convince his readers." Russell quotes a letter Leibniz wrote to Arnauld: "I expected ... that the argument drawn from the general nature of propositions would make some impression on your mind; but I confess also that few people are capable of appreciating such abstract truths, and that perhaps no one but you would have so easily perceived its force." *Philosophy of Leibniz*, 10. Whatever the reasons for Leibniz's reluctance to employ the complete notion argument, he chose to present another basis for his metaphysics in the *Système nouveau*, namely, the account based on force and unity to be discussed here.

activity.²² I shall reconstruct Leibniz's argument for the claim that matter is grounded in unities with degrees of force in three stages, before addressing an important objection in a fourth stage. First, Leibniz argues against Descartes that matter cannot be constituted solely by extension. Leibniz starts by noting that the labyrinth of the continuum creates a problem for the view that matter consists in extension alone. On the basis of his reflections on the nature of parts and wholes, he concludes that extension must be grounded in non-extended unities. In the second stage, he establishes that these non-extended unities must have intrinsic principles of activity. The third stage starts from Leibniz's characterization of the nature of the activity of non-extended unities as representational and argues from this that these unities are individuated by their principles of intensity. Since the unities are purely representational, they must be individuated either in virtue of the content of their representations or in virtue of some other aspect of their representational nature. They cannot, however, be individuated by the content of their representations, because each unity represents the whole world. This leads Leibniz to argue that they must be individuated by the intensity of their representations: he identifies the principle of activity as that which has intensive magnitudes. This provides an initial model for understanding Leibniz's concept of primitive active force.²³ The

²² Cf. Leibniz's letter to Remond, GP 3:606; L 654–655.

²³ The term "primitive active force" comes from Leibniz's 1695 *Specimen dynamicum*, where he distinguishes between primitive and derivative active and passive forces (AG 118–138; GM 6:234–254). "*Active force* (which might not inappropriately be called *power* [*virtus*], as some do) is twofold, that is, either *primitive*, which is inherent in every corporeal substance *per se* (since I believe that it is contrary to the nature of things that a body be altogether at rest), or *derivative*, which, resulting from a limitation of primitive force through the collision of bodies with one another, for example, is found in different degrees. Indeed, primitive force (which is nothing but the first entelechy) corresponds to the *soul or substantial form*. ... Similarly, passive force is also twofold, either primitive or derivative. And indeed, the *primitive force of being acted upon* [*vis*

fourth stage addresses an objection to the theory of primitive active forces developed thus far regarding the reality of the appetitive continuum. While it seems as though the appetitive continuum must be real, for Leibniz, this conflicts with his commitment to the ideality of all continua. I will suggest a solution to this, by taking the principle of primitive active force as foundational and the time sequence of these states as an abstraction. This account raises an intriguing parallel with Leibniz's theory of the infinitesimal, which I briefly explore in the final, fifth section. This provides a transition to my account of Leibniz's response to Foucher's objections.

1.1 Extension must be grounded in non-extended unities

Leibniz argues that there is a fundamental problem with extension itself that makes it incapable of constituting the being of a thing.²⁴ This argument fulfills the promise Leibniz made in his brief text from 1694, “On the Correction of Metaphysics and the Concept of

primitiva patiendi] or of *resisting* constitutes that which is called *primary matter* in the schools, if correctly interpreted. This force is that by virtue of which it happens that a body cannot be penetrated by another body, but presents an obstacle to it, and at the same time is endowed with a certain laziness, so to speak, that is, an opposition to motion... As a result, the *derivative force of being acted upon* later shows itself to different degrees in *secondary matter*” (AG 119–120; GM 6:236–237). In chapter 2, section 3, I consider *primitive passive force*. For a discussion of the *Specimen dynamicum*, see Garber, *Leibniz: Body, Substance, Monad*, 132–144, and Adams, *Leibniz: Determinist, Theist, Idealist*, 341–300.

²⁴ Leibniz does not, however, abandon the idea of the composition of simple substances. Instead, he claims that composites are grounded in simple substances that are active and have intensive magnitudes. Then, these unities can be put in relations to one another and ground extended substances. The precise relation between the simple substances and the extended substances is a thorny question. Put simply, the problem with extension is that it forms a continuum, but as Leibniz established in “De minimo et maximo: De corporibus et mentibus” (1672–73), a continuum cannot be composed of minima, that is, parts that themselves are indivisible: “Nullum datur Minimum, sive indivisibile in spatio et corpore” (AA 3.5.97). Any continuum (such as space, time, motion) cannot be composed of parts. Intensity thus enters as a way to describe the kind of quantity that can be present in a simple substance, where this quantity is not increased or decreased through repetition, but rather through intensification or remission of degree.

Substance,” in which he charges the Cartesians with “absurdly put[ting] the nature of corporeal substance in extension” (L 432; GP 4:468–469). In the 1694 text, Leibniz claims that something beyond extension—force—is required to ground extended things, but he provides no justification for this claim. In 1695, however, he comes up with a direct argument for the claim that extension cannot be the only constituent of matter. In the *Système nouveau*, Leibniz argues for substantial forms by appealing to the puzzle concerning unity and multiplicity introduced at the beginning of this chapter.

The difficulty preventing extension from solely constituting material things stems from Leibniz’s requirement that being must have unity.²⁵ Leibniz starts from the premise that *Quodlibet ens est unum*, or any being must be *one* being.²⁶ In other words, for a being to exist at all, it must be unified. The requirement of unity roughly consists in the claim that to be a being, something must possess determinate criteria of identity that suffice to distinguish that thing from everything else. The minimal criterion of being entails that God is capable of picking out the thing as an individual. Leibniz then asks whether extension has the unity necessary for an extended thing to be a single being. He argues that extension alone cannot satisfy the requirement that every being be genuinely one.

²⁵ There is a further problem with conceiving of extended things as composed of homogenous parts: since these parts would differ only in virtue of number and position and not by intrinsic qualities, Leibniz’s principle of the Identity of Indiscernibles would be violated. According to this principle, “[p]oser deux choses indiscernables, est poser la meme choses sous deux noms” (fourth letter to Clarke, GP 7:372). Thus, the Cartesian conception of matter can be ruled out, because it would posit differences in extension that are not grounded in qualitative differences.

²⁶ The idea of the “convertibility” of being and unity is found in Aristotle’s *Metaphysics*, Γ, 2, 1003b27 and echoed in Boethius’ *De duabis naturis* 4 and his *De unitate*. The phrase “quodlibet ens est UNUM, VERUM, BONUM” became a commonplace of scholastic philosophy and is referred to as such in Kant’s *Kritik der reinen Vernunft*, B113. Thus, even while Leibniz writes of freeing himself from the “yoke of Aristotle,” he continues to accept this basic premise of Aristotelian metaphysics.

He demonstrates this by relating an autobiographical account of his examination and rejection of each possibility for grounding unity in extension alone.

Leibniz explains that: “Au commencement, lorsque je m’estois affranchi du joug d’Aristote, j’avois donné dans le vuide et dans les Atomes, car c’est ce qui remplit le mieux l’imagination” (GP 4:478). Democritean Atomism, popularized in the mid-seventeenth century by Gassendi, accepts, of course, the premise that reality must be grounded in unities and gives a straightforward answer as to what these unities are: the smallest bits of matter. Leibniz writes, however, that he quickly realized that material atoms could not be the real unities: “Mais en estant revenu, après bien des meditations, je m’apperceus, qu’il est impossible de trouver *les principes d’une veritable Unité* dans la matiere seule ou dans ce qui n’est que passif; puisque tout n’y est que collection ou amas de parties jusqu’à l’infini” (GP 4:478).²⁷ Leibniz quickly moves from this statement that a real unity cannot be a material atom to the claim that it must be an “atome formel” (GP 4:479).²⁸ This leads to a significant problem regarding the relationship between formal atoms and matter. Since “formal atoms” have a different nature from matter, it is difficult to see the way in which they could constitute the unity of material being.²⁹ Leibniz’s

²⁷ As Richard Arthur points out in his superb introduction to LLC, xlv ff., however, Gassendi’s was not the only type of atomism circulating in the seventeenth century. Leibniz was, in fact, familiar with other forms of atomism, including the so-called “chemical atomism” of Daniel Sennert and Joachim Jungius, who imbued their atoms with an “active power,” which they named with the Greek term, *energeia*. Arthur notes Leibniz’s recurrent invocation of atomism in the 1670s, as well as his characterization of substances as “metaphysical atoms” in the “Système nouveau.” See also Richard Arthur, “The Enigma of Leibniz’s Atomism,” *Oxford Studies in Early Modern Philosophy* 1 (2003): 183–227.

²⁸ See the footnote to GP 4:478–479. The phrase “atome formel” does not occur in the body of the text, which reproduces Leibniz’s final markings. It does, however, occur in the original printed article.

²⁹ Compare Richard Arthur’s discussion of this problem in “Russell’s Conundrum: On the Relation of Leibniz’s Monads to the Continuum” in James Robert Brown and Jürgen

claim that the reality of matter derives from formal unities might appear to appeal to a conception of the collection according to which the elements collected, the formal atoms, are the parts of the collection. Leibniz's examples of the relation between a multitude and a unity, which he uses to bolster his view of non-material atoms, are of this sort. Leibniz compares the multitude of matter to an army, a flock of sheep, or a pond full of fish, and it is evident that the reality of a flock of sheep, the whole, depends upon the reality of each individual sheep, the parts of the whole.³⁰ The whole of the collection depends upon the entities collected, each of which, *prima facie*, is ontologically prior to and independent of the whole.

According to Leibniz's own definition, however, matter cannot consist in a collection of material unities in the same sense as a flock of sheep is composed of sheep. The unities that give reality to matter cannot be its parts, because, as he writes in this paragraph, "tout n'y est que collection ou amas de parties jusqu'à l'infini" (GP 4:478);

Mittelstrass, eds., *An Intimate Relation: Studies in the History and Philosophy of Science Presented to Robert E. Butts on His 60th Birthday* (Boston: Kluwer Academic Publishers, 1989), 171–201. Arthur explains: "For it is hard to see how monads, which Leibniz describes as mind-like units containing force and perception, could be *derived* from difficulties with the notion of continuous matter; or how their existence contributes towards a resolution of these difficulties. ... This, then, is Russell's conundrum: if monads are not parts of continuous bodies, it is difficult to see how Leibniz could have supposed that their introduction would solve the problems of the continuum; whereas if they are, his position seems to lapse into inconsistency" (172–173). Since simple substances (or monads in Leibniz's later terminology) cannot be parts of matter, I take Leibniz to be saying that there is another relation of constitution besides the part/whole relation. This will be explored further in the remarks on Foucher's objections.

³⁰ GP 4:482: "De plus, par le moyen de l'âme ou forme, il y a une véritable unité qui répond à ce qu'on appelle *moy* en nous; ce qui ne scauroit avoir lieu n'y dans les machines de l'art, n'y dans la simple masse de la matière, quelque organisée qu'elle puisse être; qu'on ne peut considérer que comme une armée ou un troupeau, ou comme un étang plein de poissons, ou comme une montre composée de ressorts et de roues." See also GP 4:492, where Leibniz introduces the example of the body of a sheep.

there are no smallest parts out of which matter could be composed.³¹ The parts of matter are themselves extended and multiple, and this is true however small the parts considered. Leibniz denies Democritean atomism—the view that matter can have smallest parts, indivisible material unities—because matter is, as Leibniz will argue, not only infinitely divisible but actually infinitely divided. Nor can matter be composed of points: “Or la multitude ne pouvant avoir sa realité que *des unités veritables* qui viennent d’ailleurs et sont tout autre chose que les points mathematiques qui ne sont que des extremités de l’étendu et des modifications dont il est constant, que le *continuum* ne scauroit estre composé” (GP 4:478).

As Leibniz’s reference here makes clear, this difficulty regarding the parts of matter is the famous “labyrinth of the continuum,” the problem, as Stuart Brown puts it, “of how anything that is extended in space and time can be real if each of its parts is further divisible *ad infinitum*.”³² The infinite divisibility of anything extended arises from the geometrical properties of extension itself: unless one denies the applicability of geometry to the spatiotemporal world, then one must accept that each arbitrarily small

³¹ In this passage, Leibniz uses the term “part” to designate the extended components of an extended thing. I stick to this usage in my discussion and take “part” as a technical term for this relation in order to contrast it with the sort of relation that holds between simple substances and extended matter.

³² Stuart Brown, “The Seventeenth-Century Intellectual Background,” in Nicholas Jolley ed., *The Cambridge Companion to Leibniz* (Cambridge: Cambridge University Press, 1995), 43–66 at 51. Brown points out here that the problem of the composition of the continuum was much discussed by the scholastics. Brown locates it specifically in the writings of Libert Fromond, who composed the *Labyrinthis, sive, De compositione continui liber vnus philosophis, mathematicis, theologis utilis ac iucundus* in 1631. The discussion concerning the composition of the continuum goes back at least to Aristotle, however. For a collection of the relevant passages from Aristotle, Galileo, Descartes, Hobbes, and Gassendi, see Richard Arthur’s appendix in LLC 347–364. For an informative account of the history of this problem from Aristotle’s Greek commentators to the fourteenth century, see the essays in Norman Kretzmann ed., *Infinity and Continuity in Ancient and Medieval Thought* (Ithaca: Cornell University Press, 1982).

extended thing can be further subdivided. Aristotle had already identified infinite divisibility as a property of all continua—such as space and time—and answered perhaps the earliest version of the paradoxes of continuity, Zeno’s paradoxes of motion. Aristotle argued that motion through a spatiotemporal continuum is possible, because divisions within the continuum are merely potential and not actual.³³ Aristotle’s solution, however, conflicts with the thesis, widely held in the early modern period, that the parts of an extended being exist prior to division.³⁴

Since the parts of an extended thing are “concrete existents in their own right,”³⁵ they must all be determinate. Furthermore, this doctrine seems to imply that there are indivisible, smallest constituents of bodies, since if any part can be further divided, then it already exists as further divided. From these two premises—the infinite divisibility of extended beings and the independent existence of parts—one can adduce the thesis that matter will be composed of an infinite number of parts.³⁶ This claim, however, leads to many well-known paradoxes concerning the nature and size of infinite collections.³⁷

Leibniz calls this set of concerns the “labyrinth of the continuum” and calls it one of the

³³ Aristotle, *Physics*, VI, 2, 233a 21–23, 26–31.

³⁴ This is the thesis Holden terms the “actual parts doctrine”: “According to this metaphysical doctrine, basic to the new world-view of the seventeenth and eighteenth centuries, the parts of material bodies are each concrete existents in their own right. They each enjoy a distinct existence independently of the whole and prior to any act of division.” *Architecture of Matter*, 2–3.

³⁵ Holden, *Architecture of Matter*, 2.

³⁶ These are versions of the two “corollaries” of the actual parts doctrine that Holden draws; see *Architecture of Matter*, 32–35. In Holden’s formulation, the first corollary is that “[b]odies have a determinate number of parts” and the second that “[b]odies are constructed from metaphysical atoms.”

³⁷ For a taxonomy of these paradoxes, see Holden, *Architecture of Matter*, 35–50. As Holden notes, many have assumed post-Cantor that these paradoxes can be easily dispelled once different sizes of infinity are countenanced and infinite collections are allowed. Holden argues, however, that when taken as an argument regarding not mathematical structures as such but the actual physical world, the paradoxes retain much of their power.

“deux Labyrinthes fameux,” writing that it “consiste dans la discussion *de la continuité, et des indivisibles*, qui en paroissent les Elémens, et où doit entrer la consideration de *l’Infini*” (GP 6:29, T 53).³⁸ In a letter to Arnauld, Leibniz already claims that the labyrinth of the continuum can only be solved by rejecting the Cartesian claim that extension is the essence of body: “... et même les difficultés de *compositione continui* ne se resoudront jamais, tant qu’on considerera l’étendu comme faisant la substance des corps, et nous nous embarrassons de nos propres chimeres” (GP 2:98).

Leibniz’s argument in the *New System* that matter must be grounded is non-extended unities relies upon these considerations. Leibniz first asserts that matter’s extension has infinitely many parts.³⁹ Because a continuum can be divided without end, it cannot contain ultimate simples and therefore cannot be fully real. Since matter regarded as extension is continuous, it thus cannot be fully real. Furthermore, what reality it has must be derived from another entity that does have unities at its base, since unities are the only source of reality. What, then, has unities and can ground the reality of extended matter? Leibniz says that he was “contraint de recourir à un atome formel” (GP 4:478–479) to solve the problem of the continuum; he was forced to make the unextended the

³⁸ For discussion, see Richard Arthur’s introduction to LLC, xxiii.

³⁹ Leibniz enthusiastically states this view in a famous passage from a letter to Simon Foucher in March, 1693: “Je suis tellement pour *l’infini actuel*, qu’au lieu d’admettre que la nature l’abhorre, comme l’on dit vulgairement, je tiens qu’elle l’affecte partout, pour mieux marquer les perfections de son auteur. Ainsi je crois qu’il n’y a aucune partie de la matiere qui ne soit, je ne dis pas divisible, mais actuellement divisée, et par consequent, la moindre particelle doit estre considerée comme un monde plein d’une infinité de creatures differentes” (GP 1:416). Richard Arthur argues that Leibniz’s support for actual infinite division derives from Descartes’s solution to the problem of how motion can occur in a plenum. Descartes points out that motion can exist in a plenum if the world is circumlunar, but, as Descartes remarks, this entails that matter is infinitely divided. See Arthur’s introduction to LLC, li–liii. See also Descartes’s *Principles of Philosophy*, §§33–35, AT 8:93–95, cited in LLC 357–358.

basis for the extended. To see how “metaphysical atoms” can lead us out of the “labyrinth of the continuum,” we must consider what the nature of these “atoms” consists in and how they avoid the paradoxes that plague the continua of time, motion, and space.⁴⁰

Formal unities cannot be *parts* of matter, because they are non-extended. Non-extended unities must *ground* matter in a different sense from that in which a whole is grounded in its parts. Leibniz explicitly denies that the non-extended unities underlying bodies are the parts of bodies in his 1690 comments on Fardella’s objections: “I do not say that the body is composed of souls, nor that body is constituted by an aggregate of souls, but that it is constituted by an aggregate of substances. ... Therefore, either there is no substance, and therefore there are no substances, or, there is something other than body. Furthermore, although the aggregate of these substances constitutes body, they do not constitute it as parts, just as points are not parts of lines, since a part is always of the same sort as the whole” (AG 105).⁴¹ The grounding relationship between non-extended

⁴⁰ This account will involve both a description of the activity of simple substances, to be undertaken in the latter portion of the current section, and a consideration of Leibniz’s distinction between the “real” and the “ideal,” to be discussed in the following section.

⁴¹ F de C 322: “Non dico corpus componi ex animabus, neque animarum aggregato corpus constituti, sed substantiarum. ... Ergo aut nulla datur substantia, adeoque nec substantiae, aut datur aliquid aliud quam corpus, non tamen constituunt per modum partis, quia pars semper toti homogenes est.” See also his 1712 letter to Des Bosses in which he reiterates this claim with regard to monads: “Monades enim esse partes corporum, tangere sese, componere corpora, non magis dici debet, quam hoc de punctis et animabus dicere licet. Et Monas, ut anima, est velut mundus quidam proprius, nullum commercium dependentiae habens nisi cum Deo” (LDB 226–27). For a discussion of Leibniz’s responses to Fardella’s objections, see Daniel Garber, “Leibniz and Fardella: Body, Substance, and Idealism,” in Paul Lodge, ed., *Leibniz and His Correspondents* (Cambridge: Cambridge University Press, 2004), 123–140. Garber argues that Leibniz is not concerned with the question of idealism versus realism, but rather with the issue of “what exactly is the nature and structure of body.” As Garber notes, Fardella holds that the Cartesian account of the nature of bodies as consisting in extension is correct, irrespective of whether bodies really exist or not. Thus, Leibniz’s dispute with Fardella concerns the Cartesian theory of the essence of

formal atoms and bodies cannot be that of part to whole because what is non-extended is not of the same kind as that which is extended.

Contrasting the relationship between intensive and extensive magnitudes provides a first indication of the way in which this alternative model of grounding functions.

Unlike extensive magnitudes, which are wholes composed of parts, the unity of an intensive magnitude grounds its degrees through a relation of “implicit containment.”

Although one substance can have more or less force than another substance, changes of degree function differently from alterations in the quantity of extension. In particular, there are two kinds of relation between unity and plurality for force and for the quantity of extension. Extension can be increased by the addition of homogenous units: if we wish to measure an area, we choose a set distance as a standard and then determine how many units the figure contains.⁴² The area of the figure is determined by the composition of these homogenous units. To increase the area, we must simply add more units. Intensive magnitudes, however, do not increase or decrease through the addition of such units, because the magnitude pertains to the entity as *one* being, not as the composite of parts. Although we will only be able to conclude that formal unities do, for Leibniz, have intensive magnitudes at the end of §1.3, this initial contrast between extensive and intensive magnitudes reveals why they provide a suitable candidate.

body: Leibniz contends, contrary to Fardella, that “bodies are actually divided into an infinity of discrete ... constituents” and that bodies must be composed of a plurality of substances (137).

⁴² Leibniz discusses the nature of quantity, extension, and measurement most fully in his late text, *Initia Rerum Mathematicarum Metaphysica* (1715): “*Extensio est spatii magnitudo. ... Quantitas seu Magnitudo est, quod in rebus sola compraesentia (seu preceptione simultanea) cognosci potest. Sic non potest cognosci, quid sit pes, quid ulna, nisi actu habeamus aliquid tanquam mensuram, quod deinde aliis applicari possit*” (GM 7:17ff).

1.2 Nothing is a unity unless it is active

Leibniz asserts that the non-extended unities underlying matter must contain a principle of activity (GP 4:478). This claim constitutes the second step in his argument that unities individuated by their degrees of primitive active force are fundamental. In this section, I shall reconstruct his claim that activity is a necessary condition for unity, which will set the stage for his characterization of this activity as inherently representational. In the paragraph presenting his argument for “formal atoms,” Leibniz interweaves considerations concerning the composition of the continuum with reflections on activity and passivity, as in this sentence, cited above: “... je m’aperceus, qu’il est impossible de trouver *les principes d’une veritable Unité* dans la matiere seul ou dans ce qui n’est que passif, puisque tout n’y est que collection ou amas de parties jusqu’à l’infini” (GP 4:478). The first question in interpreting the relations between unity and activity, multiplicity and passivity in this sentence is the logical relation posited by “ou” in the phrase “dans la matiere seul ou dans ce que n’est que passif.” One possible interpretation of the connective would be as equivalent to the Latin *sive*, making “what is only passive” another description of matter. On the other hand, “ou” might express a genuine disjunction—the Latin *vel*. The latter reading would hold open the possibility that matter could be active, as well as the possibility that something else in addition to matter might be passive. From the *puisque* clause, however, we know that matter is a collection or mass of parts to infinity, and Leibniz claims here there is no unity in such a collection. In the present context, the noteworthy question raised by this passage regards Leibniz’s reasons for saying that everything passive is a mere collection or aggregate. Two sentences later, Leibniz makes

the positive assertion that real unities must “envelopper quelque chose de forme ou d’actif,” aligning form and activity. The relationship between unity and activity has two implications: first, Leibniz maintains that unities are the only things that can be active, and, conversely, that in order for something to be a unity it must be active. Leibniz affirms that what acts must be one and what is one must act. Leibniz’s justification for this claim partially relies on his adherence to a philosophical tradition and partially depends on his own conception of the nature of unity and activity.

The connection between activity, unity, and form, on the one hand, and passivity, multiplicity, and matter, on the other, has its origins in both Aristotelianism and Neo-Platonism.⁴³ There are two features, however, of Leibniz’s account that distinguish his conception of active unities not only from the Aristotelian identification of activity and form but also from the Neo-Platonic notion of descending degrees of causal power. First, Leibniz is not arguing that there is only one unity: on the contrary, there are an

⁴³ The Aristotelian aspect of this is the claim that form is the *principium actionis*. Within the Neo-Platonic tradition, the case for the connections between unity and causality is made extensively, for instance, in the ninth- or tenth-century anonymous text known as the *Liber de Causis*, which attributes different degrees of causal power to different degrees of unification. See Fran O’Rourke, “Unity in Aquinas’s Commentary: The *Liber de Causis*,” in Jean-Marc Narbonne and Alfons Reckermann, eds., *Pensées de l’« un » dans l’histoire de la philosophie* (Laval: Presses de L’Université de Laval, 2004), 230–271 at 256: “Unity is the hallmark of ontological power and a prerequisite for the exercise of causation. *De Causis* states that because the first cause is ‘individuated by its own purity, it has the ability to infuse the intelligence and other things with goodnesses.’ While the first cause is unified to the highest degree (*maxime una*), ‘the more simple and one anything is, the closer it is to the first cause and the more it participates its proper activity.’ Subsequent levels of reality follow a descending scale of unity: the closer to the first cause, the greater their unity—and hence their power of being and operating (‘virtus essendi et operandi’). ... An intelligence is the cause of lower things, because it receives its power from a higher cause and is therefore more powerfully united. Intelligences have greater unity and simplicity than lower things.” Aquinas’ commentary on this text provides an interesting combination of Aristotelian and Neo-Platonic views on the problem of unity and causality.

infinite number of unities, an infinity of souls, that provide reality to matter.⁴⁴ In this, Leibniz departs from the Neo-Platonic picture in which all causal power emanates from a single, maximally unified source. Secondly, Leibniz argues that only activity can provide a principle that would ground the unity of substance throughout its different successive states. A one-ness without activity is impossible, at least for created beings, because without activity there would be no principle to bind the instantaneous states of the being. This implies that the relation between form and matter differs from the Aristotelian conception: for Leibniz, matter has no reality without form, and thus matter and form cannot be thought of as two ontologically distinct components of an entity.

Leibniz's argument for the convertibility of unity and activity depends upon his understanding of activity as the law-of-the-series that determines the successive states of a being. Leibniz's concept of activity can be sketched briefly by examining Bertrand Russell's analysis of activity and individuation in *A Critical Exposition of the Philosophy of Leibniz* (1900). Russell's discussion provides a helpful point of departure by identifying the central link between activity and individuation. Usually, Russell writes, he is skeptical of discussions of activity, but he is willing to grant an exception for Leibniz: "Activity is, as a rule, a cover for confused thinking; it is one of those notions which, by appealing to psychological imagination, appear to make things clear, when in reality they merely give an analogy to something familiar. Leibniz's use of activity, however, does not seem open

⁴⁴ Russell argues that Leibniz should have held a monism and not a monadology, because, he claims, only a monism is consistent with a metaphysics based on a subject/predicate logic. It is the primary thesis of Russell's work that Leibniz's metaphysics is based on this logic. See *The Philosophy of Leibniz*, 3–8.

to this charge.”⁴⁵ Russell is not simply mocking a straw man theory of activity here—though he is also doing that—but is pointing out an important feature of Leibniz’s concept of activity: that it is a concept that cannot be imagined but can be clearly conceived.⁴⁶ Leibniz’s concept of activity, according to Russell, arises as a “necessary and legitimate consequence of his notion of substance.”⁴⁷ Russell explains that activity follows from two characteristics of substance:

A substance, we have seen, is a subject which has predicates consisting of various attributes at various parts of time. We have seen also that all these predicates are involved in the notion of the subject, and that the ground of its varying attributes is, therefore, within the substance, and not to be sought in the influence of the outside world. Hence there must be, in every state of a substance, some element or quality in virtue of which that state is not permanent, but tends to pass into the next state. This element is what Leibniz means by activity.⁴⁸

In accordance with the overall thesis of his book, Russell claims that the logical relation of subject and predicate determines Leibniz’s conception of substance, but his explanation for why substance must be active is not dependent on accepting the general point. The argument here relies simply on the two ideas that substances possess attributes that vary in time and that these variations in attributes are due to something within the substance itself.⁴⁹ Russell uses this to make a stronger claim: it is not only that there must be some

⁴⁵ Russell, *The Philosophy of Leibniz*, 52.

⁴⁶ Leibniz makes this claim in *De ipsa natura*: “Haec autem vis insita distincte quidem intelligi potest, sed non explicari imaginabiliter; nec sane ita explicari debet, non magis quam natura animae; est enim *Vis* ex earum rerum numero, quae non imaginatione, sed intellectu attinguntur” (GP 4:507).

⁴⁷ Russell, *The Philosophy of Leibniz*, 53.

⁴⁸ Russell, *The Philosophy of Leibniz*, 53.

⁴⁹ In *De ipsa natura*, Leibniz argues that in order to explain causality intelligibly, one must grant that there is a “definite law of change” internal to things, a “lex insita” (to use a phrase Leibniz borrows from Schelhammer, GP 4:507). J. C. Sturm had claimed that action is due to God prescribing a law for change at the beginning of creation; Leibniz counters that this requires that created things possess a property in virtue of which they change (GP 4:507).

quality that leads to the passing of one state into another and that this activity is necessary for substance to exist, but that activity—that which allows one state to pass into the other, the quality underlying change—is what provides the unity and thus the reality of the substance.⁵⁰ Russell insists on this point when he asserts that activity is the principle by which substances are individuated: “It follows also that, as Leibniz says, without activity a substance could not preserve its numerical identity; for without activity a substance would cease to have new attributes at new moments of time, and would thus cease to exist.”⁵¹ So, what makes a substance “one,” the unity and principle of individuation, is the quality that allows different attributes of the substance to pass from one to another. Activity is a principle through which a relation of the many is created, and it is only this relational principle itself that can count as a unity.⁵²

⁵⁰ Leibniz uses this thesis that individuation requires an active force in his refutation of occasionalism in *De ipsa natura*. There he argues that if created substances had no inherent, active force, as occasionalism maintains, then there would be no enduring attributes of things that would allow us to say that things persist through time. This would lead, Leibniz claims, to Spinozism: “Ita sequeretur nullam substantiam creatam, nullam animam eandem numero manere, nihilque adeo a Deo conservari, ac proinde res omnes esse tantum evanidas quasdam sive fluxus unius divinae substantiae permanentis modificationes et phasmata, ut sic dicam; et quod eodem redit, ipsam naturam vel substantiam rerum omnium Deum esse, qualem pessimae notae doctrinam nuper scriptor quidem subtilis, at profanus, orbi invexit vel renovavit.” (GP 4:508–509). Leibniz does not fully explain—either in this passage or in what preceded it—why only a “fecundity” or “*nisus*” should be capable of persistence. Prima facie, it seems possible that a substance could possess an attribute that would define it as an individual but that this attribute would not itself provide a *lex insita*, and all changes the substance would undergo would simply be due to God’s intervention. Leibniz seems to exclude this possibility when he claims that the “nature” of a substance is its force of acting, a thesis he seems to derive from the Aristotelian conception of form (and thus nature) as active. This is a claim I will attempt to motivate in the discussion to follow, for it is implicit in Leibniz’s discussion of “substantial form or activity” in the *Système nouveau*.

⁵¹ Russell, *The Philosophy of Leibniz*, 53–54.

⁵² Russell draws a parallel between Leibniz’s discussion of activity and Rudolf Lotze’s view that, in Russell’s paraphrase, “things are laws.” *The Philosophy of Leibniz*, 56. Leibniz seems close to this position in his doctrine of activity. Russell, however, holds that, because of Leibniz’s commitment to the subject/predicate logical model as the basis of his metaphysics, Leibniz could

Russell's analysis of activity shows why Leibniz claims in the *Système nouveau* that the "nature" of substantial forms can consist in nothing other than activity: only activity can link attributes together to form a unity (GP 4:479). If there were no principle of change that provided a connection from one attribute to another, there would be no unity at all.

1.3 Unities are individuated by the intensive magnitude of their representations

The last section established that unity requires activity and considered the nature of this activity: Leibniz argues that the unity of a substance depends upon a principle of change that determines the link among attributes. From this characterization of activity, he then claims that this activity consists in representation. The present section reconstructs this claim and then shows that the principle of individuation of unities must be their degree of representational power. Unities must be individuated somehow, and since their nature is representational, this principle of individuation must be determined on the basis of some aspect of these representations. But Leibniz maintains that every unity represents the entirety of the universe, so no two unities differ in the content of their representations. They differ in what Leibniz calls their "point of view," which I will interpret as the intensity of their primitive active force.

never quite give up the idea of a substance that would exceed the law determining a series of changes. Whether or not this is true for Leibniz in general, it does not seem to apply to the *Système nouveau* where substance is exclusively defined through force. Russell's reliance upon the *Discourse on Metaphysics* as expressing Leibniz's basic convictions hinders Russell from recognizing the possibility that Leibniz is at least exploring the idea that substances are defined simply through activity in other texts.

Immediately following his claim that substantial forms must be active, Leibniz introduces this analogy: “Je trouvay donc que leur nature consiste dans la force, et que de cela s’ensuit quelque chose d’analogique au sentiment et à l’appetit; et qu’ainsi il falloit les concevoir à l’imitation de la notion que nous avons des *ames*” (GP 4:479). Leibniz claims here that the activity of substances, and thus the only metaphysically primary activity in the created world, must consist in a type of sentience, an activity continuous with our own mind’s activities of sensing, feeling, thinking, and, more generally, experiencing. The activity of non-extended unities cannot consist in any essentially spatiotemporal determinations, because this would depend upon features that do not obtain at the foundational level. It might be objected here—anticipating Kant’s charge against Leibniz in the Amphiboly of the *Critique of Pure Reason*—that Leibniz surreptitiously ignores the possibility that the metaphysically basic activity of substance might consist in some third type of determination of which we are not familiar. Kant’s objection, however, depends upon his epistemological thesis that we do not have cognition of the metaphysically basic determinations of our own activity. Leibniz could argue that the burden of proof lies on the one claiming ignorance: *prima facie* we do seem to be aware of an activity, which does not require spatiotemporal relations—our own sentience.⁵³ Since we are aware of something that does fulfill the criteria for the type of activity of non-extended substances,

⁵³ Kant’s discussion in the Amphiboly depends upon his argument in the Transcendental Aesthetic that even our awareness of our own mental states requires the form of inner intuition, time. Thus, according to Kant, our awareness of ourselves as beings with inner sense does not constitute cognition of a metaphysically fundamental activity of things in themselves. Kant argues that the rationalists’ failure to recognize the dependence of inner sense on time as a form of intuition leads them to mistake appearances for things in themselves. See A265/B321–A266/B322 for Kant’s charge against Leibniz in the Amphiboly and A30/B46–A49/B73, particularly B66–69, for Kant’s argument in the Transcendental Aesthetic. I will consider this issue more extensively in the third chapter.

and since, as souls, we are non-extended unities, our awareness of our own sentient activity provides a model for the activity of all such substances. Leibniz thus claims that all such activity can be understood on a continuum with our own form of representational life: the activity of non-extended unities consists in the formation and progression of representations: “ils ont *quelque chose de vital* et une *espece de perception*” (GP 4:482–483).

Several pages later, Leibniz emphasizes that the representational activity of these unities must arise from their own natures and argues that his theory of preestablished harmony accounts for this requirement: :

C’est qu’il faut donc dire que Dieu a créé d’abord l’ame, ou toute autre unité réelle de telle sorte, que tout luy doit naistre de son propre fonds, par une parfaite *spontanéité* à l’égard d’elle-même, et pourtant avec une parfaite *conformité* aux choses de dehors. ...[I]l faut que ces perceptions internes dans l’ame même luy arrivent par sa propre constitution originale, c’est à dire par la nature representative (capable d’exprimer les estres hors d’elle par rapport à ses organes) qui luy a esté donnée des sa création, et qui fait son caractere individuel (GP 4:484)

Preestablished harmony refers to a coordination between independent orders: force is a perfect spontaneity of the substance itself, allowing it to represent the multiple, in fact the entirety of the multiple, the world as a whole. This implies that these unities encompass the *totality*, in so far as they express the *whole* of the world without any influence from an “outside,” from the world.⁵⁴ “Spontaneity with regard to itself” is paired here with “conformity to the things outside.” This coupling of spontaneity to self and conformity

⁵⁴ Representation, for Leibniz, is equivalent to expression, which means a correspondence or isomorphism between the orders of that which expresses and that which is expressed. The idea of harmony as a relation between two orders underlies Leibniz’s Principle of General Order, to be considered in section 1.3. The definition of expression does not, however, commit Leibniz to the actual existence of that which is expressed. For the definition to function, all that is required is for that which is expressed to have possible existence. For a discussion of this point, see Robert McRae, *Leibniz: Perception, Appetition, and Thought* (Toronto: University of Toronto Press, 1976), 64.

with the outside asserts, most obviously, that all of the properties of a substance must arise “out of its own depths,” through its “own original constitution” which consists in nothing other than its “representative nature.” This representative nature—in other words, that whose nature lies in representing and which generates representations according to its own principle—makes (*fait*) the “individual character” of the substance. This “faire” implies that the “nature” of substance has no content other than the manner by which it produces representations: substance is that whose nature is to do or make, and the nature of this doing is *representing*. The quality that underlies change, the property that creates the relation of the many, is this power to represent. In Leibniz’s analysis, it is the power to draw from one’s own depths in conformity (“avec une parfaite *conformité*”) with the external world.

Leibniz’s explanation of the nature of activity implies that the content of representations cannot provide the principle of individuation for non-extended unities: in the discussion of preestablished harmony I have just considered, what makes a substance an individual is its power to produce a representation that expresses everything which this substance is not. Individuality consists in a capacity to generate representations that are in “conformity” with the universe.⁵⁵ Thus, substances cannot be individuated by what they represent, because all substances represent or express everything. This conclusion also follows from the discussion of the “representative nature” of substances: this nature does not lie in *what* the substance represents but in the *way* in which it represents everything.

⁵⁵ Leibniz explicitly affirms this in one of the most well-known phrases in his entire corpus: “toute Monade étant un miroir de l’univers à sa mode” (*Monadology*, §63, GP 6:617–618). Despite the fame of this aspect of Leibniz’s theory, the paradoxical implications of it are rarely discussed, since the claim that monads mirror the universe is seldom considered in connection with the idea that the *individuating* principle for monads is their representative nature.

Distinguishing between what a substance represents and how it does so shows what Leibniz means when he claims that substances differ according to their “point of view.”⁵⁶ The point of view of a simple substance is determined by the degree of strength of the perceptions of the simple substance. Each substance expresses one particular “corporeal machine” most distinctly: this machine is the body of the substance. In his parenthetical comment above, Leibniz refers to the “organs” of the substance. These organs are the bodies that the simple substance expresses most distinctly, and it is in relation to them that the rest of the world is perceived.⁵⁷ The representative nature of a substance thus determines which body is expressed most distinctly, as well as the different degrees of distinctness of expression. This provides a criterion for distinguishing substances and suggests what Leibniz means by “force”: the force of a substance is what confers a degree of distinctness to the representations of a substance. Since substances are individuated by their specific force, the distinctness of representations reveals the nature of a substance. What is specific to a substance is the *intensity* of its activity: since Leibniz argues that substances are constituted by activity and that they differ from one another in virtue of the strength of this activity, then it is intensity—the degree of force—that distinguishes one substance from another.

⁵⁶ *Monadology*, §57, GP 6:616.

⁵⁷ Bodies themselves contain an infinity of simple substances, as Leibniz writes in his response to Foucher’s objections: “il est vray que le nombre des substances simples qui entrent dans une masse quelque petite qu’elle soit, est infini, puisqu’outre l’ame qui fait l’unité réelle de l’animal, le corps du mouton (par exemple) est soubdivisé actuellement, c’est à dire qu’il est encor un assemblage d’animaux ou de plantes invisible, composés de même outre ce qui fait aussi leur unité réelle” (GP 4:492). This infinity of simple substances will be considered in the next section. The question of whether bodies have any existence over and above that of these soul-like simple substances—i.e. whether Leibniz subscribes to a form of phenomenalism—is a difficult one that I will leave aside for now. Leibniz seems to argue that the only thing that confers reality is a unity with a principle of activity—and thus something mind-like.

This allows for a more precise description of how intensive unities ground multiplicity. The discussion of the problem of the continuum revealed that Leibniz must argue that these unities bear a relation to the multiple unlike that of parts to a whole. They must not only be constituents of the whole but must, in some manner, already contain the whole implicitly. This relation of implicit containment can now be spelled out more exactly: the unities or simple substances express or represent the many in accordance with the degree of strength of their representative nature, which determines how clearly or confusedly their perceptions express different parts of the world.⁵⁸ The degree of primitive active force is not a coefficient that would determine all the representations of the unity as possessing one amount of strength. The different representational states of a substance can vary in intensity according to the specific law-of-the-series of the substance. This law-of-the-series, however, can thus determine different states as possessing differing degrees of clarity and distinctness; however, Leibniz later distinguishes the basic representational capacities of kinds of substances. In the *Monadology*, he distinguishes the representational capacities of three types of monads: bare monads, animals, and rational beings.⁵⁹ Leibniz's classification of kinds of substance implies that there are thresholds among different degrees of intensity. Although intensity itself is a continuous property, qualitatively different kinds of representation arise when

⁵⁸ In the *Monadology*, Leibniz explicitly uses his account of the representational nature of monads to explain the relation between unity and multiplicity within the monad: "13. Ce detail doit envelopper une multitude dans l'unité ou dans le simple. Car tout changement naturel se faisant par degrés, quelque chose change, et quelque chose reste; et par conséquent il faut que dans la substance simple il y ait une pluralité d'affections et de rapports quoyqu'il n'y en ait de parties. 14. L'état passager qui enveloppe et représente une multitude dans l'unité ou dans la substance simple n'est autre chose que ce qu'on appelle la *Perception*, qu'on doit bien distinguer de l'appercption ou de la conscience, comme il paroitra dans la suite" (GP 4:608).

⁵⁹ *Monadology*, §§19–30, GP 6:610–612.

these thresholds are crossed.⁶⁰ Each substance thus has a principle of activity of a particular intensive magnitude that both determines a maximum kind of perception for the substance (confused, clear, or distinct perception) and determines the specific intensities of the individual representations of this substance. The intensities of the representational states thus differ from one another but all arise from the law-of-the-series, the primitive active force of the substance, that itself has a specific degree.

1.4 The problem of the appetitive continuum

This account of Leibniz's non-extended unities as individuated by a primitive active force possessing an intensive magnitude faces a problem concerning the continuum. This difficulty arises because Leibniz must, according to our proposal, assert the fundamental reality of what I shall term the "appetitive continuum," but this conflicts with Leibniz's thesis that all *quanta continua* are mere idealities. This thesis is essential to Leibniz's way out of the labyrinth of the continuum. The present section will reconstruct this problem and then sketch a solution to it, based on the suggestion that the temporal continuum of representational states should be interpreted as an abstraction from the fundamental active

⁶⁰ For a careful discussion of the way in which the perceptual continuum generates seemingly discontinuous levels of representation, see Larry Jorgenson, "The Principle of Continuity and Leibniz's Theory of Consciousness," *Journal of the History of Philosophy*, 47 (2009): 223–248. Jorgenson argues that Leibniz's law of continuity implies that all apparently discontinuous types of representation are reducible to different degrees of representational force, since otherwise there would be "leaps" in perception. He develops a model to account for the seemingly discontinuous character of kinds of representational activity. For a contrasting view in which consciousness is a second-order state grounded in the first order perceptual continuum, see Allison Simmons, "Changing the Cartesian Mind: Leibniz on Sensation, Representation and Consciousness," *Philosophical Review* 101 (2001): 31–75. For the basic problem of discontinuity, see Mark Kulstad, *Leibniz on Apperception, Consciousness and Reflection* (Munich: Philosophia, 1990).

unity of the substance. I will begin by introducing Leibniz's conception of the appetitive principle as that which accounts for the transition from one perceptual state to another.

Activity does not merely consist in having perceptions of the world. Instead, Leibniz describes the activity of the substance as being both perception and appetite, with appetite leading from one perceptual state to another. Appetite is the tendency within a state to move beyond that state into a new perceptual state, which will then contain representations incompatible those of the previous state.⁶¹ Force is the capacity to represent, create, and develop a sequence of "well-founded phenomena" or expressions of the world from a principle of spontaneity. This sequence does not merely consist in discrete states subject to an ordering but instead includes a principle that accounts for the transition from one state to another distinct and incompatible state. Since the activity of representation can only be fully understood in relation to a change in perceptual state, it seems that this activity must make reference to a notion of time that is sufficient to ground the possession of incompatible states by a subject. Furthermore, it appears that appetite is a "generative principle" that allows for "becoming," providing a transition from one state to another. This, however, seems to conflict with Leibniz's theory of the ideal character of both space and time.

⁶¹ See, again, the *Initia rerum*, where Leibniz defines the order of the simultaneous as containing those things which do not contradict each other: "*Si plures ponantur existere rerum status, nihil oppositum involventes, dicentur existere simul*" (GM 7:17). From this, he derives his definition of the order of time as that which does not exist simultaneously, i.e. successive states are incompatible and thus cannot exist at the same time. One state is "before" another if it contains the ground for the latter. Since different states contradict one another, this means that one state will contain the ground for a contradictory determination.

According to Leibniz, space and time are both orderings, abstracted from things that are extended or things that change, respectively.⁶² Both are continua and both are indefinite (something they share with all abstractions). This does not seem to account for the sort of temporality a substance must have for Leibniz. The incongruence arises when we consider the real bases of the two orders. Extended things only derive their reality from the unities of which they are composed: the order of extension is founded on a metaphysically more basic realm of non-extended simples. Change, however, not only occurs on the phenomenal level but is an essential property of substances themselves, so it seems that there must be real time for non-extended substances.⁶³

Appetition is the principle by which the set of perceptions at one time leads to a new perceptual state and is thus the principle of the real *activity* of perceptions. As that which accounts for the transition or passage from one perceptual state to another,

⁶² Leibniz states this in a number of places, perhaps most famously in his correspondence with Clarke. In his third letter, Leibniz introduces his own view: “Pour moy, j’ay marqué plus d’une fois, que je tenois *l’Espace* pour quelque chose de purement relatif, comme le *Temps*; pour un ordre des Coexistences, comme le temps est un ordre de successions. Car l’espace marque en termes de possibilité un ordre des choses qui existent en même temps, en tant qu’elles existent ensemble, sans entrer dans leur manieres d’exister particulieres: et lors qu’on voit plusieurs choses ensemble, on s’apperçoit de cet ordre des choses entre elles” (GP 7:363). See also the *Initia rerum* (GM 7:17).

⁶³ For a clear statement of this view, see Leibniz’s 1703 letter to de Volder where he claims: “Nec vero mutatio omnis ab externo esse debet, cum contra substantiae finitae essentialis sit interna tendentia ad mutationem” (GP 2:252). Since Leibniz also insists that time, like space, is ideal, some commentators, including Nicholas Rescher and J. E. McGuire have postulated that there are two times for Leibniz: a merely phenomenal, abstract, relational time that orders states among monads and the internal time of each monad. According to McGuire, the internal time of the monad is also *discontinuous*. See Nicholas Rescher, *The Philosophy of Leibniz* (New Jersey: Prentice-Hall, 1967), and J. E. McGuire, “‘Labyrinthus Continui’: Leibniz on Substance, Activity and Matter,” in P.K. Machamer and R.G. Turnbull, eds., *Motion and Time, Space and Matter* (Columbus: Ohio State University Press, 1976), 290–326. In “Leibniz’s Theory of Time,” in Kathleen Okruhlik and James Robert Brown, eds., *The Natural Philosophy of Leibniz* (Dordrecht: Reidel, 1985), 263–314, Richard Arthur argues against this that there is only one temporal order that holds for both intra- and inter-monadic states and that Leibniz’s claim that the order of time is ideal does not contradict the view that time applies to monadic activity.

appetitions allow for the continuity of perceptual states and thus the unity of the simple substance itself; for, if there were a discontinuity between representative states, there would be a gap in the existence of the substance itself, since it cannot exist without perceiving. It appears that the problem of the composition of the continuum re-emerges in the order of time or change. While extended bodies must be composed of unities, the force that grounds the existence of unities forms a “real” continuum of perception, in which appetitions provide the “connectivity” or “transition” from one state to another, determining the sequence of representations.⁶⁴ The simple substance acts with a force possessing an intensive magnitude that determines a continuum of states of representation,

⁶⁴ Arthur describes appetitions as providing a “principle of becoming” in “Leibniz’s Theory of Time,” 276. Arthur also affirms that Leibniz conceives of monads as “continuously active” (264). These claims—ones with which I am in complete agreement—stand in at least apparent tension with Arthur’s exposition of Leibniz’s theory of time as deriving from a *series* of states. While Arthur explicitly introduces appetitions as a “bridging” principle, allowing the monadic states to be the result of continuous monadic activity, the possibility for any such bridge is not provided. Furthermore, there seems to be a contradiction between Leibniz’s claim that continua are always *indefinite* and his description of monadic activity (which is, of course, fully determined) as continuous. These difficulties emerge most clearly in the final section of his article, where Arthur summarizes his account of the relation between phenomenal changes and monadic states: “I concluded that as early as 1676 Leibniz’s analysis of phenomenal change had convinced him that the cause or principle of change had to be sought on a supraphenomenal level, namely in ‘those things which by acting do not change,’ thus precluding a theory of time founded on phenomenal changes alone. Since phenomenal changes result from aggregations of monadic states, however, they are ordered by the same time concept as the states on which they are founded” (301). Arthur thus argues that the difficulties of the continuum plague any account of change on the phenomenal level and thus preclude an account of time that takes relations among phenomena as fundamental. These difficulties can be solved, Arthur claims, by turning to the “supraphenomenal,” monadic level, where real becoming is possible. The difficulty is, however, that the same problems plaguing continuous motion at the phenomenal level recur at the monadic. It is not sufficient to say, as Arthur contends, that monads “by acting do not change” (301), because monadic states do change.

transitioning from one to another on the basis of this force itself under the name “appetition.”⁶⁵

In his early writings, Leibniz argues that because the continuum cannot be composed of indivisibles, it must be construed as indefinite and thus as ideal.⁶⁶ The perceptual continuum of the simple substance, however, seems to disobey both requirements. Monadic activity appears to be composed of indivisible moments, the representative states, and to be ultimately real, insofar as it is only through perceptual activity that substances exist at all. To the first objection, we can reply that perhaps the continuum of activity is not in fact *composed* of instantaneous representations. It certainly appears as if perceptions were instantaneous constituents of the continuum of monadic activity, held together by the glue of appetitions. To affirm this, however, would be to lose one’s way in the labyrinth. An alternative to this conception might consider the “perceptual moment” as itself an abstraction from an originary perceptual-appetitive activity, consisting in a form of life that we can only interpret by abstracting out a sequence of perceptual states. In this sense, there would be no moments underlying the continuum but instead an intensive unity of activity that would itself provide the ground

⁶⁵ This formulation reveals an additional difficulty in Leibniz’s account: how can the activity of substances be both continuous and contain states? See “De minimo et maximo,” AA 3.5.98.

⁶⁶ For the most complete early account of Leibniz’s analysis of the continuum, see the dialogue *Pacidius Philalethi* (AA 6.3.529–571, LLC 128–221). Leibniz argues there for an occasionalism that he would abandon by 1686. See Arthur, “Leibniz’s Theory of Time,” 296–301, for an account of the *Pacidius* dialogue in relation to Leibniz’s later views. Samuel Levey argues that Leibniz’s 1676 dialogue presents a solution to the paradoxes of motion by introducing a “fractal” conception of motion, according to which motion “everywhere displays a non-uniformity.” See Levey, “The Interval of Motion in Leibniz’s *Pacidius Philalethi*,” *Noûs* 37 (2003): 371–416 at 371. In the *Pacidius*, Leibniz argues that the notion of a “moment of change” (AA 6.3.567, LLC 211) is incoherent but that without such a moment a body cannot be said to act. He concludes that only a being that can act without changing is capable of providing the true ground of motion and proposes that God “transcreates” bodies at each point in an interval. In his post-1686 writings, Leibniz attributes this power to simple substance.

for what we interpret as a continuum of perceptions joined by appetitions. On this reading, perceptions do not constitute the continuum, so they would not violate the requirement that a continuum has no constituents. Instead, the continuum would be an abstraction from the perceptual-appetitive unity of the substance.⁶⁷ This provides a sketch of one solution to the objection. In order to assess its plausibility, we must consider more carefully the complex relationship between realities and idealities. Leibniz's solution to the paradoxes of the continuum relies centrally upon the distinction between the real and the ideal. The second part of this chapter will discuss Leibniz's presentation of this distinction in his response to Foucher's objections to the *New System*. Before considering these texts, I will briefly note an analogy between formal atoms and the infinitesimals of the calculus. The parallels between these two concepts are not only historically interesting but also provide an example of the way in which the ideal mirrors the real.

1.5 The analogy between formal atoms and infinitesimals

There is an intriguing analogy between Leibniz's metaphysical theory and a central concept of the mathematical theory he developed between 1672 and 1676, the differential and integral calculus.⁶⁸ In both his work in mathematics and his metaphysical theory, Leibniz confronted the problem of the infinitesimal, the question of whether

⁶⁷ This would mean that perceptions played an analogous role to the "now" in Aristotle's theory of time. For Aristotle's argument see, *Physics* IV, 13, 222a10–15.

⁶⁸ In 1684 and 1686, Leibniz published his first papers on the calculus, "Nova methodus pro maximis et minimis, itemque tangentibus, quae nec fractas nec irrationales quantitates moratur, et singulare pro illis calculi genus," and "De geometria recondita et analysi indivisibilium atque infinitorum" (in GM 5:220–226 and 5:226–233). As Leibniz recounts in his "Historia et origo calculi differentialis," the mathematical discoveries underlying the calculus took place in 1672–76 (Child 22–58; HO 1–20).

there could be magnitudes smaller than any finite quantity.⁶⁹ In his theory of monadic activity, Leibniz posits a principle of generation that underlies the continuum. Interpreted in physical terms, appetitions would represent a rate of change or “velocity” of the alteration in monadic representations. In the new mathematics of the Calculus, infinitesimals play a similar role: the basic procedures of differentiation and integration all at least appear to rely on elements smaller than any given finite quantities, differentials. Only quantities that do not behave like finite quantities, quantities that, metaphorically speaking, operated in a space *between* nothing and something, could resolve the incongruity between the rectilinear and the curvilinear that had concerned geometers since Pythagoras. But it does not seem that this sort of quantity is logically or ontologically possible, since infinitesimals appear to possess contradictory properties.⁷⁰

One interpretation of these differentials is to regard them in physical terms as the temporal rate of change. To do this would be to take time as an independent variable and to interpret the curve as generated by a moving point.⁷¹ Leibniz, however, does not

⁶⁹ Infinitesimals had been recognized as mathematically fruitful, though logically dubious, since at least Democritus. For the story of the infinitesimal’s varying status in mathematical thought, see Carl Boyer, *The History of the Calculus and its Conceptual Development* (New York: Dover Publications, 1949). According to Boyer, the standard objection to infinitesimals—that what could be added to a magnitude without increasing it and subtracted from the magnitude without decreasing it must be nothing—was already made by Zeno (23). In the sixteenth and seventeenth centuries, the infinitesimal—often conceived as an “indivisible”—was employed by mathematicians and physicists including Kepler, Cavalieri, Galileo, Torricelli, Wallis, Pascal, and Barrow among others (96–186). Some of these thinkers considered infinitesimals to be fixed indivisibles of a lower dimension than finite magnitudes, while others conceived of them as varying quantities, and still others grounded them in a “principle of continuity.” Leibniz chose the last route in providing a logical foundation for the calculus.

⁷⁰ Boyer sees in the nineteenth-century theory of limits and infinite aggregates a triumphant end to the disputes concerning the foundations of the calculus. In what is now known as “standard analysis,” the infinitesimal plays no role.

⁷¹ In his 1669 *De analysi per aequationes numero terminorum infinitas*, Newton takes the idea of a “momentary” increase in area as his basic concept in finding quadratures. Boyer, *History of the*

ground the mathematical theory of differentials in the concepts of physics.⁷² Instead, Leibniz argues that infinitely small things, like imaginary roots, cannot have real existence but are merely symbols that can be manipulated to give correct results.⁷³ The differential seems, then, to serve as the model for appetitions, but they occupy opposed theoretical positions: while appetitions make substances real, the infinitesimal—at least conceived of as the counterpart to an actually infinite whole—is not even possible.

Nevertheless, conceiving of force as performing the same function as the differential in the calculus also helps explain a puzzling statement Leibniz makes a page later in the *New System*: “D’autant plus que la nature de la substance demande necessairement et enveloppe essentiellement un progrès ou un changement, sans lequel elle n’auroit point de force d’agir” (GP 4:485). What is confusing about this statement is that change or progress is described as a necessary condition for force, whereas it seems that the order of dependence should be reversed. If force is thought of as the “differential” of change, as performing the same role as the fictional infinitesimals of Leibniz’s calculus, this assertion makes sense; for, just as the differential does not exist without the curve whose slope it describes, so force of acting only exists in the change of

Calculus, 191. In his fluxionary calculus, first laid out in the 1671 *Methodus fluxionum et serierum infinitarum*, Newton “regarded his variable quantities as generated by the continuous motion of points, lines, and planes, rather than as aggregates of infinitesimal elements” (193). The fluxionary calculus was based on an interpretation of the infinitesimal as a rate of generation, the fluxion, of a finite quantity, the fluent. Time and motion served as the intuitive underpinnings of Newton’s theory (194).

⁷² In both his response to Nieuwentijt and his letter to Varignon, Leibniz affirms that the calculus does not depend on metaphysical considerations. Nevertheless, Leibniz does have an explanation for differentials in terms of the law of continuity (see Child 145–158; HO 39–50).

⁷³ “Mais on se trompe en voulant s’imaginer un espace absolu qui soit un tout infini composé de parties, il n’y a rien de tel, c’est une notion qui implique contradiction, et ces tous infinis, et leurs opposés infiniment petits, ne sont de mise que dans le calcul des Geometres, tout comme les racines imaginaires de l’Algèbre. (§2.17.3, GP 5:145, NE 157).

expressions that it determines. In saying that the individual nature of a substance is its principle of representation, Leibniz is asserting that the principle of change is what constitutes the essence of a substance—not any one state or even the aggregate of states but rather the force creating the passage from one state to another, the primitive active force from which we can abstract the sequence of monadic representations. Since Leibniz conceives of intensity as force, and force as a continuous activity of representing, then an essential part of the account of intensity must be appetitive power, the power that forms the unity of monadic activity. It is, as said above, a principle by which a relation among many is created, and this “making-related” is the only “thing” that is “one.” This explains Leibniz’s claim that the law-of-the-series individuates the substance: the law is the principle of activity possessing a degree of representative power.

The analogy between differentials and appetitions, however, raises the more general question of the relationship between idealities and realities: in what sense does the differential *correspond* to appetite? This question concerning the relationship between idealities and realities can be divided into two different concerns. First, one might ask whether the ideal is merely an abstraction from the real or whether the ideal provides constraints for the real. While the texts thus far considered suggest the first option, this does not seem to account for the relationship between mathematical idealities and physical realities. Mathematical idealities at least seem to have a normative force: they do not only describe how reality is but prescribe how it *must* be. The second question concerns the distinction in ontological status between idealities and realities. The next part of the chapter will examine these questions by looking at a series of texts in which

Leibniz explains his distinction between idealities and realities to the skeptic, Simon Foucher.

2. Foucher's Objection

Although Leibniz believes that his doctrine of unities with intensive magnitudes leads us out of the labyrinth of the continuum, Simon Foucher—a proponent of Academic skepticism, critic of Descartes, and longtime correspondent of Leibniz—challenges the coherence of this account.⁷⁴ Foucher argues that simple substances, far from grounding things that are extended, cannot even *exist* in the three-dimensional world of extension. Leibniz defends his solution by arguing that Foucher has confused the ideal and the real. Leibniz claims that the ideal is indefinite, whereas the real is actually divided. The response to Foucher raises several questions. First, we may ask whether the doctrine in fact dispels Foucher's objection; second, whether Leibniz provides a convincing account of the relation between the ideal and the real. Furthermore, Leibniz's doctrine that

⁷⁴ For discussion of Foucher's objections and Leibniz's response, see Garber, *Leibniz: Body, Substance, Monad*, 160–162 and 333–335. As Garber notes, in denying the reality of extension, Leibniz does not assert that the extended world is unreal. Instead, Leibniz makes the point that the ideal must be “instantiated” in something with unities (161). For a discussion of Leibniz's relationship with Foucher—which spanned from the early 1670s to Foucher's death in 1696—see Stuart Brown, “The Leibniz–Foucher Alliance and Its Philosophical Bases,” in Paul Lodge, ed., *Leibniz and His Correspondents* (Cambridge: Cambridge University Press, 2004), 74–96. Brown points out that Foucher's skepticism did not consist in “an inclination to doubt everything” but in a commitment to the “search after truth” according to rigorous principles (74). Foucher understands himself as following the tradition of Plato's Academic Skepticism, which he saw as prescribing correct methodological rules for philosophical inquiry. Brown notes that Leibniz and Foucher accurately saw themselves as sharing a commitment to the revival of ancient texts and forms of thought, as well as a mutual opposition to Cartesianism (77). Brown remarks, however, that they erred in their conviction that they held a common methodology, although Leibniz claimed to endorse Academic Skepticism in letters to Foucher in the late 1680s (77 and 81–85). Brown characterizes the tone of Foucher's response to Leibniz's “New System” as “severe, hostile, and even dismissive,” noting its dissimilarity to the “deferential” tenor Foucher had taken in their previous exchanges in the *Journal des Sçavans* (90).

everything concrete is composed raises new difficulties, for how can Leibniz locate reality in that which is “composed”—in contradistinction to that which is indefinite—when the fundamental unities are simple, uncomposed substances? Can the model of force with a degree of intensity accommodate this doctrine of composition?

In the September 1695 edition of the *Journal des Sçavans*, Foucher published a letter criticizing several of Leibniz’s views in the *Système nouveau*. One of these objections concerns the possibility of non-extended, immaterial unities underlying matter:

Je demeure d’accord avec vous, qu’on a raison de demander *des unités qui fassent la composition et la réalité de l’étenduë*. Car sans cela, comme vous remarquez fort bien, *une étenduë toujours divisible n’est qu’un composé chimérique, dont les principes n’existent point*, puisque sans unités il n’y a point de multitude véritablement. Cependant je m’étonne que l’on s’endorme sur cette question; *car les principes essentiels de l’étenduë ne scauroient exister réellement* (b). En effet, des point sans parties ne peuvent être dans l’Univers, et deux points joints ensemble ne forment aucune extension. Il est impossible qu’aucune longueur subsiste sans largeur, ni aucune superficie sans profondeur. Et il ne sert de rien d’apporter des points physiques, puisque ces points sont étendus et renferment toutes les difficultés que l’on voudroit éviter (GP 4:487)

Foucher’s objection to Leibniz’s introduction of the “principes essentiels de l’étenduë” is that there is no place for them in a universe that is structured extensionally. Foucher attempts to show that unities, far from grounding extension, are not even compatible with extended things for the reason that everything *in* a universe that is extensionally constructed must itself be extended. In making this case, Foucher points to the interdependence of the three dimensions. Any being in the world must have length, width, and depth to be capable of forming any extension. If there were points or simples, they would have to exist independently, but nothing can exist in isolation because to exist everything needs three dimensions and for something to exist in a three dimensional space

requires it to contain a multiplicity that could ground these relative spatial properties. Therefore there can be no simple substances: there is no *place* for them, since place itself belongs to the order of extension. Furthermore, since points, as Leibniz would agree, cannot be the components of lines, planes, or masses but can only be their limits, no point or any partless entity can *be part of* an extended universe. Foucher concludes from the fact that simples cannot be *parts* of extension that they therefore cannot exist, because he claims that only what is spatial—what has extension—can be a real created being: God, although non-extended, does not cohabit the world of extension.

Leibniz responds that Foucher has misunderstood him, and, to clarify the role played by simple substances, Leibniz introduces the distinction between the ideal and the real. While idealities are only relations of order and are continuous, in realities “le tout est un resultat ou assemblage des substances simples ou bien d’une multitude d’unités reelles” (GP 4:491). Since they are composed of determinate simple substances, realities are discrete. Philosophers have become embroiled in the labyrinth of the continuum because they failed to recognize this distinction and have falsely sought “des premier elemens dans les choses ideales ou rapport tout autrement qu’il ne falloir” (GP 4:491) or have denied first elements in realities out of a false analogy with idealities. Leibniz’s strategy seems to consist in banning the continuous from the realm of the real and placing it in that of the ideal. Since only ideas would be continuous and everything real discrete, Leibniz could both satisfy the requirement that unities be the bases for all reality as well as the apparently conflicting demand that quantities be continuous. Number, space, extension, and points are simply relations of order, ideas equally applicable to any possible being

whatsoever. Although they express “eternal truths,” they are only instantiated by entities that have discrete, determinate divisions. Leibniz can thus answer Foucher’s objection by arguing that since the dimensions of extension are idealities, orders of relation, they must simply describe the compositions of real unities.⁷⁵ So, Foucher’s view is an example of looking for first elements in what is only ideal, namely the continuous quantities of extension. When Foucher alleges that there is no place for simple substances in a world of extension, he is merely pointing to the incompatibility of extension, as an order of the indefinite, and real existents, which are always based on unities. Indeed, Leibniz can agree with Foucher’s claim that the point merely limits the line: the point limits continuous quantity by introducing a division. Points cannot be constituents of lines because lines cannot have “constituents”: lines exist prior to their divisions. In fact, the “metaphysical point” or simple substance can only serve as the building block of the real because it is fully determinate. In other words, it is because the metaphysical point has determinate criteria of identity that it can constitute real beings. This demonstrates why the real cannot be indefinite and explains why in a later version of the *Système nouveau*, Leibniz calls his simple substances “real and animated points” (GP 4:478; AG 139).

Leibniz seems to have come up with a distinction that dispenses with the problem of the labyrinth of the continuum, but how are the ideal and the real related? If the ideal is an order of the indefinite, how can the truths of mathematics be *applied* to the real?⁷⁶ In a sense, however, the ideal stands at the origin of the real: since God creates the world by

⁷⁵ For an elaboration upon these claims, see Leibniz’s third and fourth letters to Clarke (GP 7:363–377).

⁷⁶ For a suggestive account of this relationship that draws on the theory of fractals, see Samuel Levey, “Leibniz on Precise Shapes and the Corporeal World,” in Donald Rutherford and J. A. Cover, eds., *Leibniz: Nature and Freedom* (Oxford: Oxford University Press, 2005), 69–94.

actualizing Ideas that previously existed only in his own understanding.⁷⁷ Furthermore, substances express their nature through representations, which must be ideal. On the other hand, the ideal is supposed merely to be an abstraction from the real. As the “eternal law” for the real, the ideal seems to be prior to the real as a determining principle for the real, but as a mere abstraction from it, it would seem to be posterior to it. A similar difficulty can be observed in Leibniz’s remarks concerning the nature of force. Force is the unifying principle in simple substances, but it itself is a power to represent, to produce and regulate representations: the activity of the real is its formation of a continuum of appetitions. The real only acts by producing representations which are themselves ideal. How can the ideal both be the utterly indefinite continuum and the perfectly definite series of perceptions and appetitions? Leibniz does not address these questions in his response to Foucher, but his law of continuity is designed to bridge this gap—to preclude, in fact, the possibility of the existence of gaps or leaps at all.⁷⁸ The law of continuity thus ensures that the indefinite continuum of mathematics applies to the definite world of composite actualities. Before examining Leibniz’s law of continuity and its relation to his doctrines of actually infinite division and the composition of the continuum in the next chapter, there are two other aspects of the response to Foucher that need to be considered. First, there is an element of the response that will bring out the connection between, on the one hand, the distinction between ideality and reality

⁷⁷ See, e.g., AA 6.6.276.

⁷⁸ See, for instance, his letter to de Volder in 1699, where he explains his principle of continuity, his law of “general order” as follows: “Tale est Axioma quo utor: *nullam transitionem fieri per saltum*. Id fluere arbitror ex ordinis lege et pari ratione niti, quo id quod agnoscunt omnes, motum non fieri per saltum, id est corpus a loco ad alium locum remotum non nisi per intermedia pervenire” (GP 2:168).

and, on the other, Leibniz's account of intensity. Second, there is the difficulty regarding the composition of actual things. This second problem will introduce Leibniz's notion of infinite, definite division.

Leibniz's response to Foucher's objection consists of a long paragraph that begins by claiming Foucher has not grasped Leibniz's view and then proceeds: "L'étendue ou l'espace, et les surfaces, lignes et points qu'on y peut concevoir, ne sont que des rapports d'ordre, ou des ordres de coexistence, tant pour l'existent effectif que pour le possible qu'on pourroit y mettre à la place de ce qui est. Ainsi ils n'ont point de principes composans, non plus que le Nombre" (GP 4:491). These two sentences present the first prong of Leibniz's argument, the view that extension, space, surfaces, lines, and points cannot have first elements. This list of what cannot have first elements starts from extension itself. Now, the distinction between intensive and extensive magnitudes overlaps with that between idealities and realities. For intensities, as for idealities, the whole or unit is prior to the part. The divisions are thus merely potential, while the real acquires its status through its determinateness. As mere idealities, all quantities are intensive in the sense that the whole is prior and all divisions into parts are merely potential. This thesis follows from his assertion that numbers themselves are structured intensively.⁷⁹ They result from ideas in which the whole is the simple, containing only

⁷⁹ Russell's summary of Leibniz's distinction between the ideal and the actual is inaccurate. Russell describes the difference as consisting in a distinction between intensive and extensive quantities, writing: "The distinction is, in fact, that between intensive and extensive quantities. Extensive quantities presuppose all the constituents whose sum they are; intensive quantities, on the contrary, do not in any way presuppose the existence of smaller quantities of the same kind. Leibniz's position is, then, that spatial and temporal quantities are relations, and therefore intensive; while extension is an extensive quantity and presupposes actual parts in that which is

potential divisions. Extension itself is, apparently paradoxically, constructed intensively. This thesis upturns most common conceptions of quantity and of the distinction between extensive and intensive quantities: if quantities, based on number, are always intensive—that is, always proceed from the whole—so that even extension is founded on intensity, then quantity in abstraction from the thing of which it is a quantity can never have an extensive magnitude. This is the case, however, only for the order of extension itself and *not* for extended beings: the order of extension has to be instantiated to become real and thus for its parts to *constitute* the whole.

Leibniz’s two-sentence argument does not simply describe quantities as orders of relation among actually existing things, but says that idealities order both actual and potential existents. Relations of order are “ordres de coexistence”—that is, they are principles of order, and since they are only relational determinations, they do not contain their relata. Ideality is thus an order of “coexistence,” which governs the relations of what could possibly exist. Leibniz concludes that idealities do not have “princips composans,” because they are divisible in different ways and are not fully determined (GP 4:491). This is particularly important in distinguishing idealities from possible existents. The difference between ideality and reality is not equivalent to the modal distinction between possible and actual existents. Idealities are not possible existents that could be made actual by God’s choice; instead, they are orders of relations. A square can be *instantiated* in the world but it cannot be *made actual*, unlike the possible Sextuses of the *Theodicy*, whom God could have chosen to exist (were they compatible with the best of all possible

extended.” *The Philosophy of Leibniz*, 133. Russell is wrong to say “extension is an extensive quantity,” because in fact extension is itself merely a relation.

worlds). This distinction between idealities and possibilia creates an interesting tension in Leibniz's account, however. Realities are distinguished from idealities by being fully determinate. They are founded in unities, unlike idealities, which are mere relations of order of coexistence. This seems to apply to possible as well as actual existing things. The possible Sextus is just as determinate as the actual Sextus. He too has a complete individual concept fully specifying his nature. But Leibniz also holds that activity is required for unity. If this is the case, then possible existents must also be active. This seems to conflict, however, with Leibniz's characterization of them as only ideas in God's mind. Indeed, it provides an argument for conceiving of possible individuals as the occupants of worlds that are like our own in the sense of containing real individuals, though these other worlds are merely possible and not actual.⁸⁰

The relation between the two distinctions, intensive/extensive and ideal/actual, becomes even more vexed when we recall that substances are individuated by their primitive active forces and that they thus have intensive magnitudes. But if activity consists in creating an order among perceptual states, then activity seems to take place merely in the realm of ideas. If force is nothing other than the creation of a relation, what distinguishes a simple idea from a simple substance? Leibniz's distinction between the ideal and the actual—and with it his metaphysical and mathematical theories—rest upon his claim that the activity of the simple substance, the appetitive continuum, does not fall back into a mathematical continuum. Leibniz is always confronted with the threat,

⁸⁰ In other words, this would push Leibniz towards a view similar to David Lewis's position in *On the Plurality of Worlds* (Oxford: Blackwell, 1986). Even if Leibniz were to adopt this suggestion, however, there would be important differences between this revised Leibnizian view and Lewis's own position, since Leibniz would not be committed to each of the possible worlds' being spatiotemporal.

however, that in employing the model of a continuum of perceptual states, what is distinctive about activity will be lost.

Leibniz's defense of his distinction between an idea as a "whole" and a formal atom depends on the claim that there is indefiniteness in the idea, whereas the substance is perfectly definite. Leibniz writes:

Et comme tout est indefini dans la ligne abstraite, on y a égard à tout ce qui est possible, comme dans les fractions d'un nombre, sans se mettre en peine des divisions faites actuellement, qui designent ces points de differente maniere. Mais dans les choses substantielles actuelles le tout est un resultat ou assemblage des substances simples ou bien d'une multitude d'unités reelles (GP 4:491)

Because of the indefiniteness of division in idealities, he considers the whole ontologically prior to the part. Leibniz asserts the priority of the whole to the part in the order of idealities in the following remark:

De sorte qu'on peut dire qu'un $\frac{1}{2}$ et $\frac{1}{4}$ pris en abstrait sont independans l'un de l'autre, ou plustost le rapport total $\frac{1}{2}$ est anterieur (dans le signe de la raison, comme parlent les Scholastiques) au rapport partial $\frac{1}{4}$, puisque c'est par la soubdivision du demi qu'on vient au quatrieme, en considerant l'ordre ideal; et il en est de même de la ligne, où le tout est anterieur à la partie parceque cette partie n'est que possible et ideale (GP 4:492)

In the parenthetical comment, Leibniz notes that it is in the "signe de la raison" that the whole—or, in this instance, the relative whole, since he is comparing two fractions—is prior to the part. What Leibniz does not do in these passages, or anywhere else in his response to Foucher's objection, is to compare an individual simple substance with a simple idea. Leibniz seems to assume that the description he gave of simple substances in the *Système nouveau* itself was adequate and that what needs to be explained is the difference between composition in actualia and potential division in idealities. A simple substance is the subject of its perceptions and appetitions, a unity of force that acts by

forming multiple representations. Leibniz insists that *activity* distinguishes the ideal from the real. Simple substances differ from simple ideas because an “atom of substance” must contain not only “*l’acte* ou le complement de la possibilité, mais encor une *activité* originale” (GP 4:479). Thus, the distinction between ideal and real does not simply correspond to a difference between mind-dependent and mind-independent properties. Rather, it has its root in the notion of *activity* as defining the real or actual. Simple substances, then, are the active unities of being: they are unities and thus have being in virtue of their activity. As we have seen, however, this activity consists of nothing other than the generation of a perceptual continuum, so the actual gains its status by forming a progression of the ideal.

The second question raised by Leibniz’s distinction is how simple substances could be joined in assemblages. Simple substances do not merely perceive the multitude; they are themselves the actual—and in fact infinite—building blocks of corporeal substances. Simple substances both represent the entirety of the universe and serve as ultimate constituents of real things. In the last few lines of the response to Foucher, Leibniz again uses the example of a flock of sheep to illustrate the composition of simple substances in realities:

Mais dans les realités où il n’entre que des divisions faites actuellement, le tout n’est qu’un resultat ou assemblage, comme un troupeau de moutons; il est vray que le nombre des substances simples qui entrent dans une masse quelque petite qu’elle soit, est infini, puisqu’outre l’ame qui fait l’unité reele de l’animal, le corps du mouton (par exemple) est subdivisé actuellement, c’est à dire qu’il est encor un assemblage d’animaux ou de plantes invisibles, composé de même outre ce qui fait aussi leur unité reelle; et quoyque cela aille à l’infini, il est manifeste, qu’au bout du compte tout revient à ces unités, le reste ou les resultats n’estant que des phenomenes bien fondés (GP 4:492)

The “actual divisions” are divisions made by the principles of activity or the simple substances themselves. Thus to have “actual divisions” is simply to be composed of simple substances.⁸¹ Leibniz likens composite realities, where there are only actualized divisions, to a flock of sheep. A flock of sheep, however, has no real unity, whereas in an animal, a “machine of nature,” there is a “soul” or “form,” which unifies the parts of the animal. Each of these parts, in turn, is unified by a simple substance, and this process goes “à l’infini.” There is, therefore, a disanalogy between the first step of the division, from flock of sheep to individual sheep, and the subsequent steps, from sheep to sheep part and continuing on. Why, then, does Leibniz start on the level of the flock of sheep, which has no unifying soul or form? There are three aspects of Leibniz’s account of flock of sheep and their divisions here. The first point, which provides the initial comparison and is also Leibniz’s conclusion, is that all reality is due to unities. It is in the service of this argument that Leibniz starts with a flock of sheep, because the flock shows that only the individual sheep—the analogue to simple substances—are real. Second, it demonstrates that there are “hierarchies” of simple substances. In a sheep, for instance, there is the soul,

⁸¹ Once again, however, the question arises of how non-extended simple substances could compose realities. What relation can hold among simple substances when, as Leibniz says in the *Système nouveau*, simple substances do not influence each other? One option is that the relation among the simple substances is merely ideal. This is the option Leibniz will adopt in the *Monadology*: “Mais dans les substances simples ce n’est qu’une influence *ideale* d’une Monade sur l’autre, qui ne peut avoir son effet que par l’intervention de Dieu, en tant que dans les Idées de Dieu une Monade demande avec raison, que l’on en regle les autres dès le commencement des choses, ait regard à elle. Car puisqu’une Monade créée ne sauroit avoir une influence physique sur l’intérieur de l’autre, ce n’est que par ce moyen, que l’une peut avoir de la dépendance de l’autre” (§ 51, GP 7:615; AG 219). In the *Monadology*, Leibniz refers to the relations among monads within the animal. From this principle, we can see that these relations must be merely ideal. But is this solution adequate to preserve the reality of composite substances or does this make composites merely phenomena, aggregated only by minds? Towards the end of his life, Leibniz famously considered the possibility of a different sort of connection among simple substances: the *vinculum substantiale* mentioned in his correspondence with the Jesuit Des Bosses. For the correspondence, as well as a perceptive introduction to the issues involved, see LDB.

which unifies the parts of the sheep. Each one of the sheep's organs has a controlling simple substance that unifies the simple substances "beneath" or "within" it, and so on. This "and so on" forms the third aspect of Leibniz's account, his acceptance of an actual infinity.

Leibniz's endorsement of actual infinity is perhaps the most perplexing aspect of the account. Leibniz admits that the actual division of substances "goes to infinity," so there is an infinity not only of matter but also of the real constituents underlying the material. In the beginning of the *Système nouveau*, however, Leibniz argued *against* the claim that matter alone could provide a principle of unity on the grounds that matter is infinitely divisible: " ... il est impossible de trouver *les principes d'une véritable Unité* dans la matiere seule ... puisque tout n'y est que collection ou amas de parties jusqu'à l'infini" (GP 4:478). It appears, then, as though the reason why matter could not have real unities would also hold for the aggregates of real unities themselves. What is the difference between the infinite division of matter, which precludes it from having ultimate constituents, and the actual infinity of the real unities? Composite substances are actual, so there is no question of arbitrarily dividing the parts and never coming to real unities. The labyrinth of the continuum, Leibniz implies, arises not from the actual infinite but from the inability to find the unities grounding an infinite collection. If matter merely consisted in extension, then there would be no such unities. It is not the infinity of the elements of the composite that presents the problem but the indefiniteness of divisions within the merely ideal. This is not, however, the only actual infinite that Leibniz endorses. Instead, he holds that not only is there an infinite number of simple substances but that each of

these substances is an infinity to itself: “Tout Esprit estant comme un Monde à part, suffisant à luy même, independent de toute autre creature, enveloppant l’infini, exprimant l’univers, il est aussi durable, aussi subsistant, et aussi absolu que l’univers luy même des creatures” (GP 4:485–486). Each of the infinitely many spirits or simple substances encompasses an infinity, contained intensively within it; each simple substance possesses a representational force that expresses the totality of the universe. The double endorsement of actual infinities—as both contained intensively within the simple substance and in the aggregate of these substances—sets out Leibniz’s positive view of the actual infinite, in contrast to Aristotle’s position that infinity can only exist potentially.⁸²

Thus, in the *Système nouveau* and his response to Foucher’s objections, Leibniz sets out a system of proliferating infinities based upon unities with a principle of intensity. As we have seen, even though the distinctive trait of the real is *activity*, this activity can only be grasped as a perceptual continuum, which, when viewed in this way, would itself be merely ideal. This suggests that our cognition of monadic activity as a perceptual continuum is merely a product of abstraction. In the next chapter, we will approach the question of the relationship between the ideal and the real from another angle. It is, we shall see, the law of continuity that governs the relation between the actual and the ideal. It is this law that guarantees that the ideal can be instantiated by the real. Leibniz’s law of continuity, however, also underlies his treatment of intensity in the passage from the *New*

⁸² *Physics*, III, 9, 208a15–17. Although Leibniz endorsed the actual infinite in metaphysical contexts, he was much more ambivalent about its status in mathematics. See Herbert Breger’s discussion of the infinite in “Das Kontinuum bei Leibniz,” in Antonio Lamarra, ed., *L’infinito in Leibniz: Problemi e terminologia* (Rome: Edizioni dell’Ateneo, 1990), 53–67. The second actual infinity that Leibniz endorses here is, of course, an intensive infinite. For a fascinating discussion of the doctrine of the infinite, see Leibniz’s papers on Pascal (Grua 94–95 and 553–585; KS 366–385).

Essays that began our inquiry. Thus, once we have considered this law in more depth, we will be able to return to this starting point and show the way in which the concept of intensity provides a thread through the labyrinth of Leibniz's corpus.

Chapter 2

Two Consequences of the Law of Continuity:

Petites Perceptions and the Continuum of Perfections

In the Preface to the *New Essays on Human Understanding*, Leibniz writes that it is “une de mes grandes maximes et des plus vérifiées que la nature ne fait jamais des sauts” (GP 5:49, NE 56). Leibniz calls this his Law of Continuity and refers the reader to a short essay he published in the July 1687 edition of the *Nouvelles de la République des Lettres*, in which he uses this principle to argue against Descartes’s and Malebranche’s laws of motion. Leibniz claims that nature everywhere obeys the law of continuity, yet this claim seems to stand in tension with his thesis, considered in the previous chapter, that everything real is discrete. As Bertrand Russell formulates the objection, “In spite of the law of continuity, Leibniz’s philosophy may be described as a complete denial of the continuous.”¹ In the last chapter, I suggested that Leibniz’s distinction between the ideal and the real might be used to dispel the appearance of conflict between the law of continuity and the discreteness of everything real. The discreteness of the real does not violate the law of continuity because the unities composing the real are not literal parts of real things but instead provide the grounds for the definiteness of everything real.² The present chapter examines the law of

¹ Bertrand Russell, *A Critical Exposition of the Philosophy of Leibniz* (London: Routledge, 1992), 129.

² This sketch of the solution agrees in outline with the solution proposed by Timothy Crockett in “Continuity in Leibniz’s Mature Metaphysics,” *Philosophical Studies* 94 (1999), 119–138. Crockett distinguishes between two concepts of continuity—density and indeterminacy—and argues that real things can possess continuity in the first but not the second sense. Only idealities are continuous in the latter sense, but the law of continuity merely requires that realities have continuity in the first sense. For a systematic reconstruction of representation and continuity

continuity more carefully, focusing on two types of continua: the continuum of perceptual states and the continuum of perfections. These are particularly difficult and important cases of the law of continuity, because both are metaphysically basic: they pertain to the fundamental order of monadic activity. Monads differ from one another according to their degrees of perception. The degree of perception, in turn, can be defined through Leibniz's concept of a perfection as the degree of unification of the many within the one. In the *Monadology*, Leibniz defines perfection as the “grandeur de la réalité positive prise précisément” (§41, GP 6:613, AG 218) and writes that the “moyen d'obtenir autant de perfection qu'il se peut” is to “obtenir autant de variété qu'il est possible, mais avec le plus grand ordre qui se puisse” (§58, GP 6:616, AG 220).³ These definitions imply that the perfection of a perceptual state consists in the degree to which it unifies many in one, that the degree of perfection of a being derives from the degree of perfection of its states, and that the perfection of the world is generated from the unity and diversity of the perfections of the beings within it.⁴

in Leibniz, see also Dionysius A. Anapolitanos, *Leibniz: Representation, Continuity and the Spatiotemporal* (Dordrecht: Kluwer, 1999).

³ See also Leibniz's 1677 letter to Eckhard, discussed in the previous chapter. Leibniz endorses Eckhard's definition in his notes to Eckhard's letters: “*Perfection* for me is quantity or degree of reality” (AA 2.1.327, GP 1:225, cited in Robert Adams, *Leibniz: Determinist, Theist, Idealist* (Oxford: Oxford University Press, 1994), 121; see Adams's useful discussion at 120–123).

⁴ In his 1672–73 *Confessio philosophi*, Leibniz defines harmony as “the relation of identity to diversity ... unity in multiplicity; it is greater when it is the unity of the greatest number of apparently disorderly elements, which are resolved into ... the greatest concordance,” and in his *De arcanis sublimium et de summa rerum* of 1676, Leibniz writes that “to exist ... is nothing other than to be harmonious” (AA 6.3.116–122 and 6.3.474, quoted by Maria Rosa Antognazza, *Leibniz: An Intellectual Biography* (Cambridge: Cambridge University Press, 2009), 172). Antognazza provides the following helpful summary of the relationship between harmony and perfection for Leibniz: “In light of these definitions, the identification of ‘to exist’ with ‘to be harmonious’ meant that ‘to exist’ was to realize in a single individual that ‘unity in multiplicity’ or ‘diversity compensated by identity’ which constituted harmony. In turn, harmony was the criterion of God's choice in the creation of the world. ... God chose to create that series of

Leibniz's definition of the degree of perfection as the degree to which many is unified into one became the central concept in his rationalist successors' theories of psychology, ethics, and aesthetics. Christian Wolff, Johann Christian Gottsched, Alexander Baumgarten, and Moses Mendelssohn—as well as a range of other philosophers of the early and mid-eighteenth century—all adopted the principle that perfections occur along a continuum and that the place of each perfection is determined by the degree to which it unifies the many. Of particular importance for this study is their use of the principle of perfection in their aesthetic theories.⁵ In his *Psychologia empirica*, Wolff defines pleasure as the *cognitio intuitiva perfectionis* and beauty as the *observabilitas perfectionis*.⁶ It is Baumgarten, however, who most directly confronts the questions raised by the continuity of perfections. Indeed, the problems generated by the continua of perfection and cognition led him to formulate the new science of aesthetics. For Baumgarten, the continuum of perfection combines two different dimensions: a unity is “extensively” more perfect the more elements it unifies, and, secondly, it is “intensively” more perfect

compossible beings which contained the greatest quantity of essence. In the Platonic framework embraced by Leibniz, the degree of perfection enjoyed by a being was nothing else than the magnitude of its positive reality, that is, of what ‘is positive and absolute in essence.’ In turn, the amount of positive reality of a being corresponded to the degree of its metaphysical goodness. To achieve the greatest metaphysical goodness meant to create the world which included the greatest perfection, that is, the greatest quantity of positive reality or essence to be found in beings which were in harmony with one another... In short, God created that world which was the best because it was the most harmonious in the sense that it contained the maximum of positive essence which could coexist, or the maximum of multiplicity which could be recalled to unity” (173).

⁵ For a helpful account of their use of this principle—and an invaluable discussion of the tenets of aesthetic rationalism more generally—see Frederick Beiser, *Diotima's Children: German Aesthetic Rationalism from Leibniz to Lessing* (Oxford: Oxford University Press, 2009).

⁶ *Psychologica empirica*, §511, in *Gesammelte Werke*, ed. Jean École et al. (Hildesheim: Olms, 1962–), II/5:389, and §545, II/5:421, quoted by Beiser, *Diotima's Children*, 60 and 63.

the greater the degree of unity.⁷ But, as is widely recognized, Baumgarten's science of aesthetics must explain how a sharp distinction between cognitive faculties is grounded in a continuum of cognition.⁸ Baumgarten seems to face a dilemma: if he insists that the continuum of perfections is fundamental, then the autonomy of the science of aesthetics is placed at risk. On the other hand, if he draws a firm border between sensible cognition—the proper object of aesthetics—and rational cognition, then the account of the continuum of perfection appears to be undermined.

Baumgarten's application of a "degree of unity" to the cognitive faculties derives from Leibniz's theory of the continuum of cognition. Indeed, while the problem of reconciling the division of the faculties with the continuum of perfections becomes particularly acute in Baumgarten's formulation of a new science based on a distinct faculty of sensible cognition, it is already present in Leibniz's account. Studying this problem in Leibniz's thought is, moreover, instructive because Leibniz himself formulates the problem in all its generality as the difficulty of finding an exit from the labyrinth of the continuum.

⁷ See Alexander Baumgarten, *Reflections on Poetry*, trans. Karl Aschenbrenner and William Holther (Berkeley: University of California Press, 1954) (with a separately paginated photoreproduction of the 1735 first edition). In §16, Baumgarten distinguishes between extensive and intensive clarity, claiming that extensive clarity is relevant for the evaluation of poetic merit: "When in representation A more is represented than in B, C, D, and so on, but all are confused, A will be said to be extensively clearer than the rest. We have had to add this restriction so that we may distinguish these degrees of clarity from those, already sufficiently understood, which, through a discrimination of characteristics, plumb the depths of cognition and render one representation intensively clearer than another" (43; Latin text 9).

⁸ In *Aesthetica* (Frankfurt an der Oder: Kleyb, 1750; rpt. Hildesheim: Olms, 1986), §7, Baumgarten claims that the transition from obscurity to clarity of thought must also be continuous: "Ex nocte per auroram meridies." Baumgarten defines aesthetics as the *scientia cognitionis sensitivae* in §1.

In one of his earliest published philosophical essays, *Meditationes de cognitione, veritate et ideis* (1684, GP 4:422–426, AG 23–27), Leibniz introduced a hierarchy of ideas. Although Leibniz’s scale draws on Descartes’s distinction between clear and distinct ideas, Leibniz’s tree is more complex: “knowledge is either obscure or *clear*, and again, clear knowledge is either confused or *distinct*, and distinct knowledge either inadequate or *adequate*, and adequate knowledge either symbolic or *intuitive*: and indeed, if knowledge were, at the same time, both adequate and intuitive, it would be absolutely perfect” (AG 23).⁹ This tree of cognition arranges types of cognition according to determinate divisions in kind. The borders among the different kinds of ideas are sharp, so the hierarchy of ideas appears to require discrete divisions. In the *New Essays*, however, Leibniz frequently speaks of a perceptual continuum in which perceptions differ in their degree of strength, from unconscious *petites perceptions* through sensation and to rational knowledge.¹⁰ The problem of reconciling these two models provides an instance of the more general question of the generation of discrete divisions out of a continuous quantity. Indeed, Leibniz confronts three related problems concerning degrees of perfection and the continuum of cognition. First, Leibniz must account for the emergence of qualitatively

⁹ GP 4:422: “Est ergo cognitio vel obscura vel clara, et clara rursus vel confusa vel distincta, et distincta vel inadaequata vel adaequata, item vel symbolica vel intuitiva: et quidem si simul adaequata et intuitiva sit, perfectissima est.”

¹⁰ Margaret Dauler Wilson warns against conflating Leibniz’s account of the hierarchy of ideas with his views on distinct and confused perceptions in “Confused vs. Distinct Perception in Leibniz: Consciousness, Representation, and God’s Mind,” in her *Ideas and Mechanism: Essays on Early Modern Philosophy* (Princeton: Princeton University Press, 1999), 336–352, 339. There is, however, an extensive recent debate regarding the relationship between the continuum of perceptions and the apparently discrete types of cognition. This debate focuses on the relationship between perception and consciousness. See Allison Simmons, “Changing the Cartesian Mind: Leibniz on Sensation, Representation and Consciousness,” *Philosophical Review* 101 (2001): 31–75, and Larry Jorgenson, “The Principle of Continuity and Leibniz’s Theory of Consciousness,” *Journal of the History of Philosophy*, 47 (2009): 223–248.

different types of cognizing beings that are nevertheless individuated by their degrees of perceptual strength. Second, he must explain the way in which mental acts that seem to have sharp borders—such as awareness, sensation, or reflection upon the self—are founded in perceptions with degrees of strength.¹¹ Third, Leibniz also faces the problem of accounting for the apparent distinctness and simplicity of our perceptions. The question of the composition of sensation out of *petites perceptions* raises several issues that will be considered later—including the question of whether *petites perceptions* are parts of sensations.

This chapter concerns the compositional basis for the continua of perception and perfection rather than how this continuum generates apparently discrete ideas: the task will be to examine Leibniz's use of the law of continuity with regard to the continuity of cognition and perfection. The first section examines Leibniz's law of continuity, reconstructing the way in which Leibniz derives this law from the general principle that the rational investigation of the world can never encounter a border beyond which things are inexplicable. Leibniz's basic statement of the law of continuity—nature nowhere makes leaps—in turn leads to his more technical definition of the law of continuity, analogous to the contemporary epsilon-delta definition of the limit. I then

¹¹ See Simmons, "Changing the Cartesian Mind," 52–61, for a reconstruction of Leibniz's theory here. As already mentioned, Simmons thinks that consciousness requires a second-order form of perception: in her account, a perception must be capable of being *noticed*—it must rise to a degree of force that enables it to "attract" another perception. This binding of the second perception to the first constitutes consciousness. Simmons makes the more general—and very helpful—point that it is only Leibniz's new model of the essence of mental life as representational—as consisting in states that represent or express the world—that allows for the question of consciousness to be informatively posed. Since, for Descartes, mind and consciousness are one and the same, the question of the nature of consciousness does not even arise in a manner that would allow us to investigate it. Because Cartesians take consciousness as a primitive, its nature remains mysterious.

briefly sketch the range of problems to which Leibniz applied the law of continuity—among them, providing an explanation for the laws of motion, the infinitesimals of the calculus, and the soul’s immortality—before addressing one application of the law of continuity: the relation of expression between perceptions and the world. The relation of expression corresponds in a uniquely manifest way to the structure of Leibniz’s epsilon-delta version of the law of continuity. Perceptions, the expressors, are complex wholes composed of an infinity of *petites perceptions* with a particular relational structure. The structure of perceptions is isomorphic to the structure of the physical correlates of perceptions—that which is perceived. This isomorphism between the order of the expressor and that of the expressed demonstrates the correlation captured by the law of continuity. I then explain how the structure of the expression relation generates the continua of perceptual degrees and degrees of perfection.

The second section considers the role of *petites perceptions*—perceptions that fall beneath a threshold of awareness—in Leibniz’s theory of the perceptual continuum. The perceptual states of finite beings are composed out of *petites perceptions*. Leibniz argues for the doctrine of *petites perceptions* both from the law of continuity and from independent considerations derived from the specific features of our perceptual experience. Along with these considerations, however, Leibniz’s account of *petites perceptions* derives from his fundamental shift from a Cartesian account of the essence of mind as consciousness to a theory of perceptions as representational states.¹² Since there is no intrinsic connection between representation and awareness, Leibniz has no reason to endorse the view that we

¹² See, again, Simmons, “Changing the Cartesian Mind,” 52–61, for a clear account of the difference between the Cartesian and Leibnizian models, as well as an argument for the importance of this shift.

are aware of all our perceptions—and, since Leibniz holds that we represent the entirety of the world, he has strong reasons for denying that thesis.¹³ Although they constitute perhaps the most distinctive aspect of Leibniz’s account of perception, as unconscious perceptions they are notoriously difficult to characterize. We cannot directly observe them—they are not present to the imagination; instead, we must reason indirectly concerning their properties. Leibniz’s discussions of *petites perceptions* suggest several initial constraints on any interpretation of *petites perceptions*: first, they are a type of perceptions and thus have those properties essential to perception as such—they represent or express the world. Second, they have an intensity below the threshold of awareness. Third, they can make a noticeable difference in our perceptual state, even though we do not notice them individually. Fourth, the complexity of our perceptual states is frequently hidden from our awareness. This unnoticed complexity accounts for the *je ne sais quoi*: the complex perceptual state appears as if it were simple, but its unmanifested complexity accounts for its particular vividness. I will develop these four features of *petites perceptions* in the section. This will demonstrate the importance of the *je ne sais quoi* to Leibniz’s theory. As we have seen, in the Preface to the *New Essays*, Leibniz claims that *petites perceptions* “Ce sont elles qui forment ce je ne sçay quoi, ces gouts, ces images des qualités des sens, claires dans l’assemblage, mais confuses dans les parties,” (GP 5:48, NE Preface, 54–55). The *je ne sais quoi* results from the confusion that attends the composition of a perceptual state out of an infinity of *petites perceptions*. This confusion is required to account for the imaginary simplicity of a perceptual state. Rather than a mere peripheral

¹³ As Margaret Dauler Wilson argues, perceptions, for Leibniz, should not be interpreted as possessing intrinsic intensionality. Only “external deducibility” is required. “Confused vs. Distinct Perception,” 342–343.

feature of Leibniz's account, the *je ne sais quoi* thus plays an important role in explaining the composition of perception.

The third section discusses several aspects concerning the composition of perceptual states and the nature of the continuum of perfections. I first argue that the continuum of beings—from bare monads possessing only *petites perceptions* to the highest being, God—depends upon Leibniz's theory of activity. Certain perceptual states such as joy, happiness, and pleasure constitutively involve their own intensification. They contain a tendency towards the increase of their very perfection. This active dimension of Leibniz's theory of states reveals the specific character of his theory of beauty: the contemplation of beauty is what allows for this progress along the intensive continuum of perfection. Finally, the section turns to the highest degree along the continuum of perfections—the infinite unity of God. Here I will consider two short passages—one from the *New Essays* and the other from *De ipsa natura*, in which Leibniz mentions intensity by name. Both concern the idea that God is a qualitative infinite: he possesses the ultimate or Absolute degree of perfection. Only intensive continua have a highest degree; extensive continua do not. The section thus concludes that perfection has an intensive magnitude—it has an ultimate degree—which God possesses as the Absolute, qualitative infinity. God's absolute, qualitative infinity constitutes a superior form of infinity, and this infinity grounds the inferior types of infinity that define each level of perfection descending along the chain of beings. Leibniz argues that even the “almost nothing,” the *petite perception*, has a relationship to the infinite. It occurs along the chain leading to God's highest infinity.

The fourth and final section addresses a problem generated by Leibniz's theory of the continuum of perfection: Leibniz provides a principle for the perfections of the creatures along this chain, but he does not seem to have an account of the grounds for their imperfections. Descent along the chain of being would appear to require a separate metaphysical principle from that which underlies their perfections, since otherwise there would seem to be no metaphysical explanation for creatures falling short of the highest degree. Leibniz's theory of primary and secondary matter can be used to address this objection. Primary matter is an inertial force that *limits* the activity of substances: it is what prevents the activity of substances from acting without bound. But, Leibniz argues, the limiting force of matter does not require its own ontological source. Nor does it require God to bear responsibility for limitation. Instead, Leibniz claims that creatures are, as such, intrinsically limited. I will argue that primitive passive force provides the intrinsic limitation that is required for the continuity of being. Leibniz's theory of primitive active and passive forces thus explains the composition of the continuum of perfections out of perceptual states.

1. The Law of Continuity

Leibniz's 1687 essay in the *Nouvelles de la République des Lettres* provides the first published statement of the law of continuity.¹⁴ Leibniz responds in this essay to Malebranche's comments concerning his 1686 "Brief Demonstration of a Notable Error of Descartes

¹⁴ As Jorgenson notes in "The Principle of Continuity," 224, Leibniz did not call this the "law of continuity" until a few years later. The earliest instance Jorgenson finds is contained in Leibniz's 1692 "Critical Thoughts on the General Part of the Principles of Descartes" (GP 4:354–392; L 383–412). I will return to this text in my discussion of Leibniz's use of the law of continuity to object to Descartes's laws of impact.

and Others Concerning a Natural Law” (GM 6:117–199; L 296–301), as well as to his own criticisms of Malebranche’s laws of motion in a letter to Bayle (GP 3:46–49).¹⁵ Leibniz’s 1686 text focuses on Descartes’s principle of the quantity of motion, according to which “God conserves the same quantity of motion in the world” (L 296).¹⁶ Leibniz begins his response to Malebranche the following year with a statement of a “[p]rincipe de l’ordre general.” This principle, Leibniz writes, serves as a “preuve ou examen pour faire voir d’abord et par dehors le défaut d’une opinion mal concertée avant même que de venir à une discussion interieure” Immediately following this remark, he provides two formulations of the principle, the first more formal and the second more “common.” The principle, he writes, “depend encor d’un principe plus general, sçavoir: *Datis ordinatis etiam quaesita sunt ordinata* [as the data are ordered, so the unknowns are ordered also]” (GP 3:52; L 351). Next, he provides examples drawn from mathematics and physics, before considering the objection that “dans les choses composées quelques fois un petit changement peut faire un grand effet”; for instance “une etinscelle tombant dans une grande masse de la poudre à canon est capable de renverser toute une ville.” Leibniz responds that this effect follows from “les principes generaux mêmes” (GP 3:54; L 353)

¹⁵ For an account of Leibniz’s critique of Descartes’s principle of the conservation of motion, see Daniel Garber, “Leibniz: Physics and Philosophy,” in Nicholas Jolley, ed., *The Cambridge Companion to Leibniz* (Cambridge: Cambridge University Press, 1994), 270–352, 309–314. As Garber notes, Leibniz’s criticisms of the principle of conservation of motive force were heavily indebted to Huygens’s earlier critiques, but it was Leibniz’s paper that sparked the so-called *vis viva* controversy, a sufficiently important disagreement to provide the occasion for Kant’s 1746 *Gedanken von der wahren Schätzung der lebendigen Kräfte*. Garber distinguishes two forms of argument Leibniz uses against Descartes in his writings from the 1670s and ’80s: an a posteriori argument based on the conservation of work, developed as early as the mid-1670s, and a priori proof based on more general principles of “action,” first proposed in the 1689–90 *Dynamica* (GM 6:291–292, AG 10–11). The “Brief Demonstration” contains only the a posteriori argument.

¹⁶ “... eandem quantiatem motus a Deo in mundum conservari” (GM 6:119). See Descartes, *Principia philosophiae*, II, §§48–49, AT 8:75.

that apply in more obviously continuous cases and that the appearance of discontinuity is merely due to the fact that the things involved are composites. It would be contrary to God's wisdom if nature did not follow this principle of general order. From this thesis, Leibniz argues for the use of final causes in physics, illustrating his point by discussing a passage from Plato's *Phaedo* concerning the use of final causes for explanation. Leibniz concludes his brief essay by distinguishing between "les effects particuliers de la nature [qui] se peuvent et se doivent expliquer mecaniquement" and "les principes generaux de la physique et de la mecanique" which themselves "dependent de la conduite d'une intelligence souveraine et ne sçauraient estre expliqués sans le faire entrer en consideration" (GP 3:55; L 353).¹⁷

Leibniz thus introduces his principle without direct argument, suggesting only that it can be derived from the more general principle that as the data are ordered, so too are the unknowns ordered, and that the ultimate ground for this law is to be found in God's wisdom. In later discussions of the law of continuity, Leibniz develops these points and attempts to show that this law follows from very basic methodological or "architectonic" principles of reasoning. Two such discussions are particularly noteworthy. The first is contained in a letter Leibniz wrote to Sophie Charlotte in 1704, in which he relates—and expands upon—the contents of a letter he had sent to Lady Masham. It is a

¹⁷ See Daniel Garber's discussion of the importance of divine wisdom in distinguishing between geometrical and physical necessity in his *Leibniz: Body, Substance, Monad* (Oxford: Oxford University Press, 2009), 225–266. Garber suggests that it was Leibniz's 1675–76 reading and meeting with Spinoza that led him to assign a greater role to divine wisdom in his account of the origin of the laws of nature. He notes that the question of distinguishing physical from geometrical necessity does not yet decide the issue of whether God's choice of laws is contingent (245). He concludes that the balance of textual evidence is in favor of contingency. Since the laws of nature can nevertheless be known a priori—because they are based on principles of divine wisdom—he claims that there is a kind of "contingent a priori" in Leibniz (248).

“popular statement” of his philosophy, and it neither refers to the law of continuity by name nor treats the application of the law to physics or mathematics, focusing instead on several other applications of the law of continuity for creatures. The letter is, however, important for understanding the way in which Leibniz saw the law of continuity as grounded in a general principle expressing God’s wisdom. Leibniz begins:

Là dessus j’ay esté obligé de luy écrire dernièrement une lettre un peu ample, où je luy ay mandé que mon grand principe des choses naturelles est celui de Harlequin Empereur de la Lune (à qui je n’ay pourtant point fait l’honneur de le citer), *que c’est tousjours et partout en toutes choses tout comme icy*. C’est à dire que la nature est uniforme dans le fond des choses, quoyqu’il y ait de la variété dans le plus et dans le moins et dans les degrés de perfection. Ce qui donne une philosophie la plus aisée et la plus concevable du monde. (GP 3:343)¹⁸

The principle of the Emperor of the Moon does not conflict, he notes, with the other great principle of his philosophy that “*che per variat natura e belia*” (GP 3:345). Leibniz reconciles these by claiming that the first comes “du fond des choses,” while the second merely concerns “des manieres et apparences.” Whatever considerations of manner led Leibniz to cite the Emperor of the Moon in his letter to Sophie Charlotte, the Emperor’s principle does indeed allow Leibniz to adduce some of the central claims of his system, including his denial of the generation or death of animals because it would rely upon “trop de saut et la nature sortiroit trop de son caractere d’uniformité par son changement essentiel inexplicable” (GP 3:345). Leibniz’s denial of leaps within the existence of beings applies the law of continuity to the existence of individual creatures.¹⁹ Elsewhere in the

¹⁸ A translation by R. S. Woolhouse and Richard Francks can be found in *New System and Associated Contemporary Texts* (Oxford: Clarendon Press, 2006), 219–220.

¹⁹ In “The Principle of Continuity,” 227, Jorgenson cites this formulation in his taxonomy of sub-principles of continuity, calling it the “continuity of existence.” He summarizes it as saying that “the beginning and end of existence is an unnatural change and introduces a gap in the natural order” and notes that it follows from the application of the requirement of density, which

letter, he argues that the uniformity of nature shows that creatures must themselves fill a continuum; that there must be a plenitude of beings; that there must be a continuum of degrees of perception among these beings; and that the perceptions within a single being vary according to degree. The first two formulations provide instances of the law of continuity for the plenitude of beings, while the final version applies the principle to the perceptual states of individual substances. Bertrand Russell notes this diversity in Leibniz's application of the law of continuity, dividing the principle into the law of "spatiotemporal continuity," the "continuity of cases," and the "continuity of forms." Russell's third type corresponds to what I have called a principle of plenitude: "That nature makes no leaps, which is the general statement of all forms of continuity, is held by Leibniz to apply also in the passage from one substance to another. If two substances differ by a finite difference, there must be, according to Leibniz, a continuous series of intermediate substances each of which differs infinitesimally from the next."²⁰ Russell judges this version of the law of continuity harshly, writing that Leibniz never offers "a shadow of a reason, except that such a world seems to him pleasanter than one with gaps,"²¹ although he speculates that the principle might be linked to the principle of spatiotemporal continuity since the continuum of creatures would correlate to their unique points of view and "accordingly neighboring spatial points should give

he argues is necessary and sufficient for continuity, in Leibniz's use of the concept: "given the requirements of density (a) existence will come in degrees (which Leibniz does not say, at least for substances) or (b) changes in existence will introduce gaps in the natural order. So a change in existence will not be a natural change" (227).

²⁰ Russell, *Philosophy of Leibniz*, 76. I take the phrase "principle of plenitude" from Arthur Lovejoy's seminal study, *The Great Chain of Being: A Study of the History of an Idea* (Cambridge, Mass.: Harvard University Press, 1936), 144–182.

²¹ Russell, *Philosophy of Leibniz*, 77.

infinitesimally different points of view, and, therefore, since the mirroring of the universe gives the whole of a monad's perceptions, neighbouring points in space should be occupied by infinitesimally different monads."²² Russell notes that this view is difficult to maintain because of the complexities of the relationship of monads to space, but he holds that it is the best attempt to motivate the continuity of forms. Leibniz himself, however, represents the "continuity of forms"—along with the "continuity of existence"²³ and the continuity of perceptions (further applications of the law of continuity Russell does not consider)—as following from a single principle. While Russell is correct in saying that the ban on leaps provides the most general formulation of Leibniz's principle, this ban is not itself unmotivated, as a closer examination of the content of the law of uniformity—the principle of the Emperor of the Moon—will show. There is a sense in which Leibniz could endorse Russell's derisive remark that a world without gaps "seems pleasanter" than one without, but Leibniz would immediately qualify this by claiming that "pleasantness" is not a subjective property but can be explained on the basis of principles of harmony and divine wisdom.

As is already apparent, the uniformity of nature in no way means that nature is repetitive or lacking in variation or complexity: the principle does not endanger Leibniz's basic commitment to the infinite diversity of the world. Leibniz emphasizes this by accompanying this principle with Tasso's maxim. Leibniz's advertisement of the merits of his own system in the first book of the *New Essays* supports this. Theophilus, his representative, says of Leibniz's system: "J'y trouve une simplicité et une uniformité

²² Russell, *Philosophy of Leibniz*, 77.

²³ This phrasing comes from Jorgensen, "Principle of Continuity," 227.

surprenantes, en sorte qu'on peut dire que c'est partout et tousjours la meme chose, aux degrés de perfection près (GP 5:64, NE §1.1, 71). In addition to stating Leibniz's thesis that all variation consists in differences of *degree* of perfection, this remark attributes to Leibniz's system the two most common criteria for evaluating different candidates for laws of nature: simplicity and uniformity. This suggests a possible interpretation for Leibniz's claim that nature is always "the same as here." This principle should be interpreted as providing a criterion for laws of nature based on Leibniz's definitions of perfection and harmony. We may recall Leibniz's thesis from the *Monadology*, quoted at the beginning of the chapter: "the way of obtaining as much perfection as possible" is to "[obtain] as much variety as possible, but with the greatest order possible" (§58, AG 220). Divine wisdom implies that God chooses the world that maximizes variety within the "greatest order possible." The principle of the Emperor of the Moon thus articulates the grounds for the divine lawmaker's choice. It was metaphysically possible for God to have created a world that would not be maximally harmonious, but such a world would be inferior to one with greater harmony. Harmony is a property not only of the relations among items within the world but of the laws of nature themselves. A law is more or less harmonious, according to this account, to the degree that it is capable of subsuming a greater number of cases under a single principle—that is, to the degree that it bans "leaps" or discordances in nature. In this sense, the law of continuity fulfills the "architectonic" criterion: it provides a meta-principle by which to evaluate different candidates for the laws of nature.

One might, however, object that this proposal would attribute to Leibniz the position that God would have to balance two considerations in deciding which world to

actualize: the total reality of the beings within the world and the degree of harmoniousness of the laws of nature themselves. But for Leibniz, unlike for Malebranche, God's choice is dictated by the single consideration of maximizing the total degree of reality of the world. This constraint is not counterbalanced by considerations regarding the degree of perfection—for instance, considerations concerning simplicity—of the laws themselves. In the *Theodicy*, however, Leibniz argues that his system generates the same result as Malebranche's:

Ainsi il faut juger que parmy les regles generales qui ne sont pas absolument necessaires, Dieu choisit celles qui sont les plus naturelles, dont il est le plus aisé de rendre raison et qui servent aussi le plus à rendre raison d'autres choses. C'est ce qui est sans doute le plus beau et le plus revenant; et quand le *systeme de l'harmonie préétablie* ne seroit point necessaire d'ailleurs, en ecartant les miracles superflus, Dieu l'auroit choisi, parce qu'il est le plus harmonique. Les voyes de Dieu sont les plus simples et les plus uniformes: c'est qu'il choisit des regles, qui se limitent le moins les unes les autres. Elles sont aussi les plus *fécondes* par rapport à la *simplicité des voyes*. On peut même reduire ces deux conditions, la simplicité et la fécondité, à un seul avantage, qui est de produire le plus de perfection qu'il est possible; et par ce moyen, le systeme du R.P. de Malebranche en cela se reduit au mien. (§208, GP 6:241, T 257)

Leibniz affirms here that God chooses to maximize perfection and that this choice maximizes the harmony within the world. But this should not be taken to entail that, for Leibniz, God must consider the harmoniousness of the possible laws of nature separately.

The harmoniousness of the laws of nature can be derived from Leibniz's criterion of "compossibility." God does not individually choose to actualize particular possible beings but evaluates which possible combination of beings will result in a world with the greatest perfection. The relevant criterion of "compossibility," however, cannot be mere logical compatibility, since any combination of beings possessing positive determinations

would seem to be logically compatible.²⁴ Instead, it must be a contingent matter which beings “fit” together. Whether beings are “compossible,” according to this account, depends on whether their co-instantiation fits with a certain set of laws of nature. The additional constraint for beings to be compossible derives from the possibility of their being instantiated within the framework of a particular set of laws of nature: in the case of the actual world, whether their instantiation is compatible with the best possible laws. This demonstrates the sense in which Leibniz can claim that his account of God’s choice of laws folds Malebranche’s two considerations into one. God chooses to actualize the world with the greatest perfection, and this world is the one in which beings harmonize most adequately—where the principle of uniformity is observed—and where the reality of those beings is maximized. This account thus also shows the unity behind Leibniz’s different versions of the law of continuity: they are all principles for the maximization of perfection. Against the background of Leibniz’s endorsement of the “principle of uniformity,” we can now explain the significance of his discussion of final causes at the end of his discussion of continuity in the *Nouvelles de la République des Lettres*: to evaluate law-candidates, “general principles,” on the basis of final causes means to judge them according to the criterion of perfection. Since the criterion of perfection prescribes greater uniformity-within-variety, this provides a standard by which to evaluate all

²⁴ See J.A. Cover and John O’Leary-Hawthorne, *Substance and Individuation in Leibniz* (Cambridge: Cambridge University Press, 1999), for a clear explanation of this problem and for a suggested solution: “Take seriously the idea ... that each monad is a world unto itself and it looks like any group of laws-of-the-series (and thus any individual substances), considered in themselves, are compossible. After all, if a law-of-the-series, considered in itself, fixes only an intrinsic monadic sequence and thus does not, considered in itself, determine any relational facts, how is it to exclude another given law-of-the-series from existing?” (136–137). I roughly follow their interpretation of compossibility in my discussion.

“general principles.” The law of continuity, in its most general version, derives from this criterion of degrees of perfection. In Leibniz’s 1687 formulation, God “agit en parfait geometre” (GP 3:52; L 351).

In a 1699 letter to Burcher de Volder, Leibniz argues from what he calls the “principle of order” to the ban on leaps. The “leaps” in question here comprise both leaps “from place to place” and “from state to state.” The continuity of motion and the continuity of states are thus explicitly at issue. Leibniz remarks that “once we have assumed that the Author of things has willed continuity of motion, this will exclude the possibility of leaps,” but asks “how can we prove that he has willed it, except through experience or by reason of order?” (L 515), and then sets out an argument, on the basis of considerations of order, against leaps.²⁵ Leibniz first asks how we can rule out the possibility that God “transcreates” a body and thus that existence and movement are “gappy” (a possibility he had in fact endorsed in his 1676 *Pacidius* dialogue):

Experience teaches us that this does not happen, but the principle of order proves it too, according to which *the more we analyze things, the more they satisfy our intellect*. This is not true of leaps, for here analysis leads us to mysteries [ἄρρητα]. Thus I believe that the same thing applies not only in transitions from place to place but also in transitions from one form to another or from one state to another. For experience, as well, refutes all changes through a leap. And I do not believe that any reason a priori can be given against a leap from place to place which is not also effective against a leap from state to state. (L 516).²⁶

²⁵ GP 2:168: “Fateor si semel assumserimus, continuitatem in motu atori rerum placuisse, eo ipso excludi saltus”

²⁶ GP 2:168: “Tale est Axioma quo utor: *nullam transitionem fieri per saltum*. Id fluere arbitror ex ordinis lege et pari ratione niti, quo id quod agnoscunt omnes motum non fieri per saltum, id est corpus a loco ad alium locum remotum non nisi per intermedia pervenire. Fateor si semel assumserimus, continuitatem in motu autori rerum placuisti, eo ipso excludi saltus; sed illam placuisti unde comprobabimus, nisi vel per experientiam vel per ordinis rationem? Cum enim omnia perpetua Dei productione et, ut loquuntur, continua creatione fiant, quidni potuisset ille corpus, ut ita dicam, transcreare de loco in locum distantem, hiatus relicto vel in tempore vel in loco, verbi gratia producendo corpus in A, deinde statim in B, etc. Hoc non fieri docet

The general principle Leibniz supplies here—that “the more we analyze things, the more they satisfy our intellect”—derives from two claims: first, God chooses according to his wisdom, and, second, our intellect has an affinity with God’s. Although God’s intellect is infinitely more perfect than our own, it is fundamentally of the same kind. This congruity between God’s infinite and our finite wisdom, combined with the principle that God chooses according to his wisdom, means that the more we contemplate nature—that is, the more adequate our ideas become with regard to what God has created—the more order we will find within nature. We will never encounter an absolute limit to what can be known to reason, because nature is the product of an absolutely wise being. Scientific inquiry will find ever-increasing order within nature. In the next sentence, Leibniz argues that a world with leaps would violate this general principle, because leaps would create gaps in the order of reasons: they would be *ἄρρητα*, “mysteries.” If analysis encountered impenetrable atoms of irrationality, then it would not be in accord with infinite wisdom. Leibniz thus reverses the ancient prohibition on irrational numbers as contrary to God’s wisdom: as befits the author of the calculus, it is not incommensurability that is seen as repugnant to God’s order; Leibniz’s *ἄρρητα* are very nearly the opposite of irrational numbers. What would be a threat to God’s wisdom are not infinite sequences, numbers that cannot be expressed in a ratio, but sequences for which no rule for generating the next item can be found. In this sense, Leibniz might be said to be generalizing the account of mathematical continuity to nature as a whole. The suggestion that Leibniz’s

experientia, sed idem comprobatur ratio ordinis quae efficit ut quanto res discutiuntur magis, tanto magis intellectui satisfiat, quod in saltibus non fit, ubi tandem analysis nos ut sic dicam ad ἄρρητα ducet. Eadem igitur puto obtinere non tantum in transitionibus de loco ad locum, sed etiam de forma ad formam, aut de statu ad statum.”

law of continuity is a generalization of a principle he develops in the calculus can be developed and made more precise by returning to his more formal presentation of the law of continuity in his 1687 article.

Leibniz's fundamental definition of the law of continuity reads:

Lorsque la difference de deux cas peut estre diminuée au dessous de toute grandeur donnée in datis ou dans ce qui est posé, il faut qu'elle se puisse trouver aussi diminuée au dessous de toute grandeur donnée in quaesitis ou dans ce qui en resulte (GP 3:52; L 351)

In a footnote to this formulation of the law, Loemker summarizes it as follows: “if $y = f(x)$, and there are two values x_1 and x_2 such that $x_1 - x_2 < d$, where d is any assignable difference, however small, then the corresponding values $y_1 - y_2 < \text{any assignable difference as well}$ ” (L 354 n. 2). This is equivalent to the epsilon-delta definition of the limit of a function at a point. Leibniz's law of continuity, in modern terms, thus asserts that every function has a limit at every point. In other words, it proclaims the universal applicability of the fundamental law of the calculus—the calculus applies to everything in the world. This principle guaranteeing the applicability of the calculus to physics and metaphysics is, however, contingent. As we have already seen, God “acts as a perfect geometrician” (L 351) because he is infinitely wise, not because it is necessary. The close tie between the law of continuity and the definition of the limit in the calculus demonstrates, however, the significance of claiming that God acts as a perfect *geometrician*. The most perfect laws of nature are those which make the calculus a universal tool. Although Leibniz only formulates the law of continuity in 1687, it unifies two of his concerns from the mid-1770s: his discovery of the infinitesimal calculus and his concern

with maintaining the contingency of the laws of nature.²⁷ The principle of order—derived from the calculus and from the principle of perfection—satisfies both of these demands.

In addition to being derived from a basic principle of the calculus, the law of continuity also allows Leibniz to explain the apparent violation of the law of non-contradiction in assuming the reality of infinitesimals in the premise of the calculation and canceling them out as equal to zero in the conclusion.²⁸ What is required, then, is an account of what it means for something to be “infinitesimally small,” and Leibniz obliges by referring to his law of continuity. When Pierre Varignon requests that Leibniz clarify his position on the reality of infinitesimals, in view of the challenges posed to the infinitesimal calculus, Leibniz claims that “il est permis de considerer le repos comme un mouvement infiniment petit (c’est à dire comme equivalent à une espece de son contradictoire)” (GM 4:91–92). The law of continuity allows the limit of a series to be considered as a particular instance of this series.

Our discussion has shown the close connections among Leibniz’s different applications of the law of continuity—from his doctrine of the continuity of forms, continuity of existence, and continuity of states to his thesis of the continuity of motion.

²⁷ I follow Garber’s suggestion here that Leibniz’s encounter with Spinoza in 1675 and 1676 most likely led him to take more seriously the problem of contingency in God’s choice of the laws of nature. As Garber notes, it is only in these years that Leibniz begins to speak frequently of God’s wisdom. The earlier *Confessio philosophi*, for instance, is primarily concerned with God’s justice. See Garber, *Leibniz: Body, Substance, Monad*, 226–245.

²⁸ For a clear account of the controversies surrounding the invention of the calculus and the accusation that the calculus violates the principle of non-contradiction, see Douglas Jesseph, “Leibniz on the Foundations of the Calculus: The Question of the Reality of Infinitesimal Magnitudes,” *Perspectives on Science* 6 (1998): 6–40. Leibniz’s basic response to this challenge is his claim that infinitesimals are “well-grounded fictions.” This doctrine, however, can only be made sense of in light of the principle of continuity, which is itself ideal but which grounds the very application of idealities to realities. See the letter to Varignon from February 2, 1702 (GM 4:91–95).

It is the latter application of the law of continuity, however, that led Leibniz to formulate his general principle in his response to Malebranche, and he uses it in the letter to provide arguments against Descartes's laws of impact, in addition to the objections he had raised against Descartes's principles of the conservation of the quantity of motion in his earlier essay.²⁹ Leibniz repeated these arguments several times in the following years. His formulation of his objections to the Cartesian laws of impact in 1692 is particularly interesting because of a diagram he appends to this work. Leibniz argues that Descartes's first two laws of motion violate the law of continuity, because they will introduce a disproportion between cause and effect: when we plot the initial velocity of one body in a collision, B, against the final velocity of the second body, C, the resulting graph will be "gappy." In contrast, his own laws of impact will generate a smooth graph, preserving the proportionality between cause and effect and obeying the law of continuity. One detail of this graph is particularly interesting in the present context: Leibniz entitles the graph depicting Descartes's laws of motion a "delineatio monstrosa" (GP 4:382). His use of the term "monstrous" is not accidental: like the monsters that would violate the determinacy of natural kinds, monstrous or "gappy" graphs disturb the harmoniousness of natural laws. Descartes's laws of impact are a "monstrosity" because they do not correspond to natural kinds.

Although Leibniz introduces the law of continuity in the middle of this controversy concerning Cartesian laws of motion, his first illustration of the law of continuity in the 1687 text comes from the mathematics of conic sections. He considers

²⁹ See Garber, "Leibniz: Physics and Philosophy," 214–216, as well as Jorgenson's helpful summary in "The Principle of Continuity," 232.

the correspondence between points on a circle and on its projection onto another surface. When a circle is projected, the figure that results is an ellipse or hyperbole. If the circle is cut by a straight line, then the projected figure is similarly divided in two. From the principle of order or continuity, we can deduce that when the distance between the two points on the circle is reduced until the line becomes tangent to the circle, the corresponding line dividing the projected figure will also become a tangent.

This example of mathematical projection can be applied more broadly to explain Leibniz's concept of expression. The relation of expression provides the foundation for Leibniz's account of the continuum of perceptions and of perfections—the focus of this chapter. One thing expresses another if there is a mapping from the expressing to the expressed thing that preserves both their situational relations and their relations of proximity: in other words, if the law of continuity holds. The law of continuity thus underlies the basic metaphysical relationship between substances and the world. When Leibniz argues that every substance expresses the world, he implies that the principle of continuity pertains to the relations among all substances: that there can be a mapping from any relation in the given, the expressing substance, to a corresponding relation in the sought, the expressed world.³⁰

The relation of expression thus transposes the formal law of continuity to the realm of substances. Substances express the entirety of the universe through their perceptual states—these states must thus be of an infinite complexity that is isomorphic to

³⁰ See *Monadology*, §56, GP 6:616: “Or cette *Liaison* ou cet accommodement de toutes les choses créées à chacune et de chacune à toutes les autres, fait que chaque substance simple a des rapports qui expriment toutes les autres, et qu'elle est par conséquent un miroir vivant perpétuel de l'univers.”

the infinite complexity of the world they express. The infinite complexity of perceptual states in turn requires that perceptual states be composed out of *petites perceptions*, perceptions of a different order of magnitude from the whole. This brief discussion has shown that the principle of perfection—that God chooses according to his wisdom—underlies the law of continuity: since God *has* the highest degree of perfection, he acts according to a principle of perfection, and thus arranges the world in the way that maximizes perfection. Maximizing perfection entails making the *principle of perfection*—the law of continuity—into a law of nature, and a world in which each creature mirrors the whole is most suited to God’s wisdom. Finally, the principle of perfection provides a systematic reason for Leibniz to posit *petites perceptions*. The principle of perfection requires continuity from the highest, qualitative infinite to the almost-nothing. One of Leibniz’s most condensed statements of these theses may be found in his 1695 response to Pascal’s concept of infinity. Leibniz writes: “Le premier *presque-Neant* en montant du rien aus choses, quisqu’il en est la plus simple, comme il es aussi le dernier *presquetout*, en descendant de la multitude des choses vers le rien; et le seul portant qui merite d’estre appelé <un Estre>, une substance apres Dieu” (Grua 554–555, KS 382). Leibniz suggests here that the almost-nothing and the almost-all share in a relationship to infinity, of which God occupies the highest and absolute degree. He also suggests, however, that beings at each of these levels can “rise” and “descend” along the scale.

2. *Petites Perceptions* and the *Je Ne Sais Quoi*

In the Preface to the *New Essays*, Leibniz states his fundamental thesis that “naturellement une substance ne sauroit estre action” (GP 5:46). As we have seen in the first chapter, Leibniz argues that activity constitutes the essence of substance. This implies, according to Leibniz, that substances must always actually act; the active principle can never consist in mere potentiality. In the *New Essays*, Leibniz applies this conception of substantial activity to the nature of thought, claiming that the mind is always thinking, even if it is not aware of its thoughts. Thought, for Leibniz, extends beyond awareness: against both Locke and the Cartesians, Leibniz rejects the identification of thought with consciousness. Leibniz’s distinction between thought and awareness underlies his account of *petites perceptions*—perceptions of which we are not individually aware but which “make themselves felt” (NE, Preface, 53) within the whole:

D’ailleurs il y a mille marques qui font juger qu’il y a à tout moment une infinité de *perceptions* en nous, mais sans apperception et sans reflexion, c’est à dire des changements dans l’ame même dont nous ne nous appercevons pas, parce que les impressions sont ou trop petites et en trop grand nombre ou trop unies, en sorte qu’elles n’ont rien d’assez distinguant à part, mais jointes à d’autres, elles ne laissent pas de faire leur effet et de se faire sentir au moins confusément dans l’assemblage. (GP 5:46, NE, Preface, 53)

This passage allows us to provide an initial description of *petites perceptions* as those that are unaccompanied by awareness or reflection. Leibniz’s use of the preposition “*sans*” might nevertheless indicate only that the particular perceptions are not directly accompanied by reflection; he leaves open the possibility that *petites perceptions* might stand in an indirect relationship to awareness or reflection.³¹ Leibniz’s statement also suggests, however, that it

³¹ Mark Kulstad emphasizes that *petites perceptions* are perceptions that are not noticed “immediately.” Leibniz’s argument that there are features of an experience that we did not notice at the time but which we later recollect when they are pointed out suggests that we may be able

is not essential to perceptions for us to be aware of them—even when we do in fact notice them. Furthermore, Leibniz’s claim suggests that, although there are not temporal gaps between perception and awareness in the case of perceptions accompanied by awareness, perception and awareness are at least conceptually distinct. While this is unsurprising in virtue of Leibniz’s definition of perception as expression rather than consciousness, it raises the further question of whether perception and the awareness are *only* conceptually distinct or whether they are distinct in a stronger sense. Awareness might be separate from perception in two further ways: it might be a non-essential, separable feature of a perceptual state or it might involve a relation among several perceptions. According to the first line of interpretation, a perception would be noticed if and only if it had a sufficient degree of strength, but the noticing would not be essential to the perception as such.³² The second suggestion would claim that noticing depends upon a relationship between at least two perceptual states, whereby the second state perceives the first.³³ Although far more extensive consideration would be required to determine which of these interpretations is most plausible, what is important here is to bear in mind the different possibilities for understanding the relationship of

to *come to an awareness* of these perceptions. See Kulstad’s “Two Arguments on *Petites Perceptions*,” *Rice University Studies* 63.4 (1977): 57–68 (quotation at 58–59).

³² The proponent of this line of interpretation might take noticing to be a necessary consequence of a perception’s degree of strength but draw a distinction between necessity and essence. Another suggestion would be that perceptions above a certain threshold are noticed only when certain contingent background conditions hold: for instance, further facts about the soul’s total mental states.

³³ This might merely be a necessary and not a sufficient condition for awareness, because the second state might have to perceive the first in a particular *manner* for awareness to result. I take this suggestion to be in the spirit of the “second-order” interpretation of awareness advocated by Simmons in “Changing the Cartesian Mind.” According to Simmons, for the soul to be aware of a perception, this perception must have a force sufficient to “capture” (57–58) or “attract” (59) a second perception.

accompaniment in considering Leibniz's definition of *petites perceptions* as those that are not accompanied by awareness or reflection. As Leibniz writes in the final line of this passage, however, *petites perceptions* can, in the company of other perceptions, have "an effect" and "make themselves felt, at least confusedly, in the whole."³⁴ *Petites perceptions* have an "effect" on the soul; they make themselves "felt," though only in relation to the whole and not as individual perceptions.

Leibniz does not list the "thousands of indications" mentioned in the passage, but he does adduce several considerations in favor of the existence of perceptions "unaccompanied by awareness or reflection." Several of these "experiential" arguments concern sleep, dreams, and waking: indeed, Leibniz introduces minute perceptions in explaining his opposition to Locke's view that we do not perceive when we sleep without dreaming.³⁵ Locke argues from an analogy between bodies at rest and minds without thought: "il objecte que puisque les corps peuvent estre sans mouvement, les ames pourront bien estre aussi sans pensée" (GP 5:46, NE, Preface, 53). Leibniz accepts the analogy and counters that neither can be without the form of activity characteristic of it. On the following page, he remarks that the possibility of awakening from a dreamless sleep in fact entails that we always perceive, even if dimly: "on ne seroit jamais éveillé par le plus grand bruit du monde, si on n'avoit quelque perception de son commencement

³⁴ The difference to the whole made by *petites perceptions* will be the focus of §2.3 below.

³⁵ See Kulstad, "Two Arguments on *Petites Perceptions*," for this term. Kulstad notes that what he calls the "experiential argument" "relies heavily on a claim that may seem paradoxical, namely, that we have experiential (or introspective) evidence for the existence of *petites perceptions*" (57). My categorization is broader than Kulstad's, however. He identifies a single such argument, taken from Leibniz's analysis of noticing a past perception when prompted (GP 5:47, NE, Preface, 54), whereas I will also use this term for Leibniz's arguments concerning sleep, dreaming, waking, color perception, comas, unease, and Buridan's ass.

qui est petit, comme on ne romproit jamais une corde par le plus grand effect du monde, si elle n'estoit tendu et allongée un peu par des moindres efforts, quoyque cette petite extension qu'ils font ne paroisse pas" (GP 5:47, NE Preface, 54). Leibniz seems to be claiming that there cannot be a threshold that demarcates the minimal amount of sound or force required to produce an effect. One might deny this on the grounds that certain effects seem to require a sufficient amount of stimulus. If the stimulus is under the threshold, it is not the case that a smaller effect is produced, rather, the stimulus lacks any effect. Consider, for instance, a rocket: without a sufficient force propelling it, the rocket will not lift off at all. Leibniz argues, however, that such cases must be merely apparent. His reason for this once again seems to be based on the law of continuity. If effects were suddenly produced, there would be "leaps" in nature. In the case of awakening from a dreamless sleep, if we did not have a slight perception of the start of the noise but simply had a sudden perception of the noise once it reached a certain level, then there would be a gap between the composition of the noise and that of our perception. Leibniz makes a similar point in the *Monadology*: "Donc, puisque reveillé de l'étourdissement, on s'aperçoit de ses perceptions, il faut bien, qu'on en ait ou immédiatement auparavant, quoyqu'on ne s'en soit point apperçù; car une perception ne sauroit venir naturellement que d'une autre perception, comme un mouvement ne peut venir naturellement que d'un mouvement" (§23, GP 6:610; AG 216). In this passage, Leibniz claims that a transition from the complete absence of perception to an apperceptive state is impossible, because a perception—whether it be noticeable or not—can only "naturally" follow from another perception. If a perception arose out of nothing, there would be no reason for its

occurrence. This version of the argument depends upon Leibniz's thesis of the causal separation of the order of perception from that of the world, a conclusion established in the first paragraphs of the *Monadology*.

Leibniz's discussion of awakening from a dreamless sleep in the Preface to the *New Essays* immediately follows perhaps his most famous illustration of the continuum of degrees of intensity. This example also concerns sound—in this instance, the noise of waves crashing to the shore. The roaring of the waves must be composed of the tiny noises produced by each wave, and we must perceive each correspondingly tiny sound in order to perceive the sound of the whole “puisque cent mille riens ne sauraient faire quelque chose” (GP 5:47, NE, Preface, 54).

Ces petites perceptions sont donc de plus grande efficace qu'on ne pense. Ce sont elles qui forment ce je ne sais quoi, ces goûts, ces images des qualités des sens, claires dans l'assemblage, mais confuses dans les parties, ces impressions que les corps environnants font sur nous, et qui enveloppent l'infini, cette liaison que chaque être a avec tout le reste de l'univers. (GP 5:48, NE, Preface, 54–55)

Minute perceptions are required for us to perceive the “images of sensible qualities”; it is not simply that they make themselves felt in the whole but that they are required for us to be aware of *any* sensible quality. If we did not have minute perceptions, we would not be aware of sensible qualities, because these qualities mirror the infinite complexity of their objects.

In his argument with Locke concerning whether the mind always thinks, Leibniz uses minute perceptions to explain how it is that the mind can think without being aware of its thought. But Leibniz also employs these minute perceptions to explain the continuity of personal identity, as well as the “disquiet” that leads us to action while we

appear to be indifferent.³⁶ The existence of minute perceptions is itself, Leibniz notes, a consequence of his law of continuity. If there were not intermediaries between noticeable qualities, such as pleasures and pains and the absence of these qualities, then leaps would occur in nature, which would, he argues, be contrary to reason. Leibniz's initial descriptions of *petites perceptions* in the Preface to the *New Essays* allow us to explain four features of these perceptions.

2.1 The doctrine of *petites perceptions* derives from the nature of perception as expression.

Leibniz's doctrine of *petites perceptions* follows from his rejection of the Cartesian model equating the soul's activity with consciousness—and thus claiming that the soul is “transparent” to itself—in favor of an account of perception as a relation of expression, in which the unity-of-multiplicity within the expressors is isomorphic to the structure in the order of the expressed. Thus, the law of continuity is responsible for *petites perceptions* for two reasons: first, as already mentioned, Leibniz claims that there must be perceptions of all degrees or else there would be “leaps” in nature. But, second, the requirement that there be *petites perceptions* itself stems from the relation of expression, and, as I argued in the first section, this new account of perception makes manifest the very structure of the law of continuity, since the law of continuity prescribes nothing other than the complete correspondence between the orders of the given and the sought: as the difference in the

³⁶ Leibniz writes that “inquiétude” is the source of our undeliberated actions and that these actions only appear to be indifferent to us. “Inquiétude” differs from pain only in degree and not in kind. See *Nouveaux essais*, Preface, GP 5:48–49, NE 56; §2.1.15, GP 5:105–106, NE 116; §2.20, GP 5:148–155, NE 162–168.

order of the given approaches zero, so too does that in the order of the sought. The series converge “in infinity.” Perfect correspondence or harmony thus requires that the actually infinite within matter be reflected within the soul’s states. This underlies Leibniz’s thesis, against Locke, that the soul always contains an infinity of perceptions. This claim thus constitutes one aspect of Leibniz’s contention in the *Monadology* that monads “vont confusément à l’infini, au tout, mais elles sont limitées et distinguées par les degrés des perceptions distinctes” (§60, GP 6:617, AG 221).

As we have seen, Leibniz introduces *petites perceptions* to explain how there can be “at every moment ... in us an infinity of perceptions” (NE Preface, 53, GP 6:46). Leibniz already declares that the mind must contain an infinity of perceptions in the 1686

Discourse on Metaphysics:

On voit aussi que les perceptions de nos sens, lors mêmes qu’elles sont claires, doivent nécessairement contenir quelque sentiment confus, car comme tous les corps de l’univers sympathisent, le nostre reçoit l’impression de tous les autres, et quoyque nos sens se rapportent à tout, il n’est pas possible que nostre ame puisse attendre à tout en particulier; c’est pourquoy nos sentimens confus sont le resultat d’une variété de perceptions, qui est tout à fait infinie. Et c’est à peu près comme le murmure confus qu’entendent ceux qui approchent du rivage de la mer, vient de l’assemblage des repercussions des vagues innombrables. Or si de plusieurs perceptions (qui ne s’accordent point à en faire une) il n’y a aucune qui excelle par dessus les autres, et si elles font à peu près des impressions également fortes ou également capables de déterminer l’attention de l’ame, elle ne s’en peut appercevoir que confusement. (§33, GP 4:458–459, AG 65)

The universal “sympathy” among the bodies in the universe leads Leibniz to conclude that our perceptions must also include a confused infinity. In the *New Essays*, Leibniz claims that all bodies are constantly in motion; there is no absolute rest in nature. The motion of any body, no matter how small, affects the whole: “Frappant un corps on y excite ou determine plustot une infinité de tourbillons comme dans une liqueur, car dans

le fonds tout solide a un degré de liquidité et tout liquide un degré de solidité, et il n’y a pas moyen d’arrester jamais entierement ces tourbillons internes” (§2.1.10, GP 5:101, NE 111). If the soul’s perceptions are to mirror nature, there must be nothing in matter that is too small or too distant not to be mirrored in the perceptions of the soul, and Leibniz therefore concludes that “si le corps n’est jamais en repos, l’ame qui y repond, ne sera jamais non plus sans perception” (§2.1.10, GP 5:101, NE 112). Indeed, Leibniz argues that once we understand the expressive relation between perceptions and the universe, the minuteness of changes in the material world will be seen to provide no obstacle at all to their reflection within the simple substance.

Leibniz derives his claim that the soul perceives even minute changes in matter from the *incongruity* between immaterial and material substance. While this difference in kind between soul and matter creates the problem of how any correspondence is possible between the states of the soul and the world, Leibniz argues that—once one accepts the preestablished harmony as the best explanation for the relation between mind and body—the very disproportionality between the soul and matter means that there is no reason to suppose that the changes in the material world must have a particular magnitude to be recorded in the soul:

En effet, s’il y avoit des impressions dans le corps pendant le sommeil ou pendant qu’on veille dont l’ame ne fut point touchée ou affectée du tout, il faudroit donner les limites à l’union de l’ame et du corps, comme si les impressions corporelles avoient besoin d’une certaine figure et grandeur pour que l’ame s’en puisse ressentir; ce qui n’est point soutenable si l’ame est incorporelle, car il n’y a point de proportion entre une substance incorporelle et une telle ou telle modification de la matiere. En un mot, c’est une grande source d’erreurs de croire qu’il n’y a aucune perception dans l’ame que celles dont elle s’apperçoit. (§2.1.15, GP 5:106, NE 116)

Leibniz twists the traditional problem of the incongruity between the soul and the body to argue for their complete congruity. Since the body and the soul differ in kind, their correspondence cannot be based in their possessing the same type of magnitude—as if the soul had a “window” or “door” through which it would allow only impressions of a particular size or shape. According to preestablished harmony, there is no impression that passes from the body to the mind or vice versa, because they are strictly incomparable orders, but this fact allows for the *expression* between the soul’s activity and the motion of matter to be perfect, so the infinitely tiny swirls in the material vortex will be mirrored in the soul’s perceptual states. Perception is a relation of complete expression: once we cease to confuse being a relatum of this relation with being an object of awareness, no impediments remain to the thesis of the completeness of this relation—perfect correspondence, the maximization of harmony and thus of perfection—is possible on the condition that we do not confine the activity of the soul to that of which we are aware.

2.2 There are infinitely many *petites perceptions*, but they do not have infinitesimal magnitudes.

Petites perceptions are necessary both to account for each total perceptual state and to explain the continuous transition from one degree of perception to a higher degree.³⁷ But

³⁷ In the *New Essays*, Leibniz presents several direct arguments in favor of unconscious reflections. Mark Kulstad considers two in “Two Arguments on Petites Perceptions.” He terms the first the “experiential” argument and the second the “regress” argument. According to the first, we have experiential reasons to accept unreflected perceptions—which Kulstad takes as equivalent to *petites perceptions*—because we can fail to reflect immediately upon a perception but then reflect on it later, for instance, when we are prompted to do so. There can thus be a temporal gap between our perception and our reflection upon our perception. From this, Kulstad concludes that *petites perceptions* are perceptions that are not *immediately* noticed, although they can

do *petites perceptions* have a qualitatively different order of magnitude from the magnitude of the total perceptual state? Initially, it would seem that they must because Leibniz holds that the perceptual state of a finite substance is composed of an infinity of minute perceptions.

The argument for the infinity of our perceptual states suggests that *petites perceptions* constitute a sort of perceptual infinitesimal. While I shall argue that this view is mistaken, it is instructive to consider an argument in its favor: if, the argument goes, the magnitude of a *petite perception* were comparable to that of the total state, it would not be possible for a state of finite magnitude to encompass an infinity of minute perceptions. From this we might conclude that *petites perceptions* will differ in magnitude from any individual noticeable perception, if we assume—as Leibniz does—that the mind can only possess a finite number of noticeable perceptions. This qualitative difference in magnitude, however, presents a difficulty for Leibniz’s theory, since in certain contexts—for instance when we become used to the noise of a mill—perceptions are no longer noticed. If perceptions can shift their degree of force depending upon the context, then it does not seem as though their magnitudes could be of qualitatively different orders.

There are several ways of reconciling these concerns. One suggestion would be that there are two sorts of perceptions falling below the threshold of consciousness: those that are intrinsically too minute to be noticed and those that can be noticed under particular conditions. According to this line of argument, Leibniz would be committed to the view that some perceptions are so minute that they could never be noticed by beings

later be noticed. According to the second argument, some thoughts must go unnoticed on pain of regress: we would always be reflecting upon our previous thoughts and could never go on to a new thought.

with finite cognitive capacities. Exercising our powers of attention and recollection might heighten the degree of other perceptions, allowing us to pick out certain features of our perceptions that usually fall under the threshold of consciousness. The other response would be that perceptions can change from possessing an infinitesimal magnitude to having a finite magnitude, depending upon features of context. For instance, when we habituate ourselves to the sound of the mill and the intensity of the sounds falls below the threshold of awareness, the perceptions diminish from a “finite” quantity to an “infinitesimal” degree of force. When we attend to the noise of the mill and thereby notice sounds that we had previously not, the perceptions rise above the threshold of awareness and are “finite.” On either interpretation, however, it seems that at least some perceptions some of the time must occupy magnitudes of a fundamentally lower order from those of which we are aware.

Thus, *petites perceptions* seem to be analogous to infinitesimals, in so far as both possess lower order magnitudes. Unlike mathematical infinitesimals, however, *petites perceptions* are fully real: they compose the perceptual states produced by the activity of the monad. This raises the worry that the same considerations that lead Leibniz to reject the reality of mathematical infinitesimals should also apply to *petites perceptions*. The analogy between infinitesimals and *petites perceptions* is inexact, however: the argument that *petites perceptions* must have a lower order of magnitude from that of noticeable perceptions derives from Leibniz’s claim that we always possess an infinity of perceptions. This led us to conclude that their magnitude must be infinitely small, since otherwise the total magnitude would be beyond any finite quantity. But Leibniz also endorses a

corresponding claim for matter: every piece of matter must always be actually infinitely divided, without holding the thesis that any chunk of matter has an infinitesimal magnitude. *Petites perceptions* should be characterized as those which—for contextual or intrinsic reasons—fall under a threshold of awareness. Like the insensible corpuscles to which Leibniz compares them, *petites perceptions* are not absolutely minimal units but rather occur along a continuum of degrees of intensity.

This result allows us to dispel the worry that Leibniz's theory of *petites perceptions* might ensnare him in the labyrinth of the continuum. This concern results from the view—now seen to be mistaken—that *petites perceptions* are simple constituents of noticeable perceptual states. If *petites perceptions* were the “atoms” of perception, then Leibniz would encounter all of the problems that plague an atomistic theory of matter. But Leibniz is not committed to this thesis and can provide an account of the composition of perception that mirrors the theory he provides regarding matter, for, despite the harmony between the world and perceptual states, an important difference remains: whereas the definiteness of matter is founded in the active unities that underlie it, perceptions simply *are* the results of the activity of simple substances. Since perceptions are not grounded in simple substances but instead constitute the activity of these substances—thus individuating them—what could account for the definiteness of perception, since perception too is inherently multiple? I would like to suggest that this difference lies in the different relations intensive and extensive magnitudes bear to multiplicity. Matter, as extended, must be grounded in simple substances, because otherwise it would not have the unity required to constitute a being. Perceptions, on the

other hand, have an intensive magnitude; they vary in degree and are complex in a fundamentally different sense from matter. The fact that they vary in intensity and possess a degree of complexity does not imply, however, that they must be grounded in unities, because they are *already* unified: intensive magnitudes differ from extensive quantities in that the whole is prior to the parts. This demonstrates another sense in which perceptions involve a “multitude dans l’unité” (*Monadology* §13, GP 6:608; AG 214): because they are intrinsically unified, they do not require grounding, as is the case for bodies.

2.3 *Petites perceptions* can make a noticeable difference in our perceptual state, even if they are not noticed; this “confused” effect produces the *je ne sais quoi*.

Petites perceptions are not, as Leibniz writes, “without awareness or reflection,” and even in the aggregate, they do not always make a noticeable difference. In states of stupor, for instance, there is “a great multitude of small perceptions” without anything “distinct”; we do not notice any aspect of our perceptions (NE, Preface, 53). Death, Leibniz claims, is such a state of stupor, comparing it to our confusion “quand on tourne continuellement d’un même sens plusieurs fois de suite, où il vient un vestige qui nous peut faire evanouir et qui ne laisse rien distinguer” (*Monadology* §21, AG 216). Repeated spinning leads to a “confusion” of sensations: we cannot assign our sensory impressions to stable, spatiotemporally fixed objects, and so our perception becomes a blur. When this confusion becomes too intense and we cannot notice anything at all—since we cannot pick anything out of the blur—we lose consciousness altogether and faint. Sensory

impressions involve a lesser degree of confusion: we can pick out or distinguish aspects of our surroundings, but we do not have fully distinct knowledge. In the *Discourse on Metaphysics*, Leibniz invokes the hierarchy of cognition he proposed in his 1684 *Meditations on Knowledge, Truth, and Ideas*:

Pour mieux entendre la nature des idées, il faut toucher quelque chose de la variété des connoissances. Quand je puis reconnoître une chose parmi les autres, sans pouvoir dire en quoy consistent ses differences ou propriétés, la connoissance est *confuse*. C'est ainsi que nous connoissons quelques fois *clairement*, sans estre en doute en aucune façon, si un poëme ou bien un tableau est bien ou mal fait, parce qu'il y a un je ne sçay quoy qui nous satisfait ou qui nous choque. Mais lors que je puis expliquer les marques que j'ay, la connoissance s'appelle *distincte*. Et telle est la connoissance d'un essayeur, qui discerne le vray or du faux par le moyen de certaines épreuves ou marques qui font la definition de l'or (§24, GP 4:449, AG 56)

When I have perception of sufficient strength to know that the object has a particular quality—for instance, whether “un tableau est bien ou mal fait”—the *petites perceptions* make a noticeable difference to my total state, even though I cannot notice them directly. This is the case, Leibniz claims, in all cases of sensory cognition: “on connoist point distinctement ny la sensation du bleu (par exemple) ny les mouvemens qui la produisent” (§2.8.15, GP 5:119; NE 131–132). Sensory cognition possesses a degree of confusion, because it always involves an infinity of perception, and our limited minds are not capable of distinct perception of infinity.

Leibniz also claims in this passage from the *Discourse on Metaphysics* that the *je ne sais quoi* results from this confusion within sensory impressions. The certainty of a judgment regarding the quality of a poem or picture comes from the minute perceptions that are apperceived only confusedly: we cannot locate the ground for the judgment, because these perceptions are mixed with one another. Thus, although the judgment is

not ungrounded, the limitation of our cognitive capacities prevents us from isolating this ground and thus from locating the source of our assent. In the next section, we will consider another case of a “certain something. In *Von der Glückseligkeit* (E 2:671–673, Grua 584–588, KS 391–400), Leibniz invokes the *ich weiss nicht was* to explain the “sympathy” involved in the experience of a particular type of pleasure, the pleasure that is not accompanied by knowledge of its causes. It is not the case for Leibniz that a *je ne sais quoi* is necessary for pleasure, but it does accompany some forms of pleasure because the perceptions of which these pleasures are composed are too manifold or faint to be noticed.

Leibniz makes an additional, intriguing remark concerning the *je ne sais quoi* in the course of a discussion concerning the nature of extension. Philalethes accuses Theophilus of flirting with Cartesianism by not allowing for two types of extension, “space and the solidity which fills it.” Philalethes remarks that “s’il se trouve de gens qui n’ayent pas ces idées distinctes (de l’espace et de la solidité qui le remplit), mais les confondent et des deux ne fassent qu’une, on ne sauroit voir comment ces personnes puissent s’entretenir avec les autres” (§2.4.5, GP 5:115, NE 127). Locke’s stand-in compares the “confounding” of space and solidity with the confusion of the blind man who lacks the sensory mode required to perceive scarlet and instead interprets the description given to it in the medium of an inappropriate sense mode. While it is not entirely clear how seriously this analogy should be taken—for instance, is Philalethes claiming that the ideas of space and of solidity arise from different senses?—Theophilus’s response is instructive: “Mais je tiens en même temps, que les idées de l’étendue et de la

solidité ne consistent point dans un *je ne say quoy* comme celle de la couleur de l'écarlate” (§2.4.5, GP 5:115, NE 127–128). Although Theophilus does not explain why the colour scarlet has a *je ne sais quoi*—apparently accounting for the incommunicability of the idea of scarlet to someone lacking the requisite mode of sense—but extension does not, one might explain this distinction based on the difference between sensations and abstractions. Extension, like the ideal figures of geometry, rests on an abstraction: it is a distinct idea, albeit one which is not fully real. The quality of scarlet, on the other hand, is a clear but confused sensory impression: it expresses something fully real, but does not do so adequately. Abstractions would not have a *je ne sais quoi*, because they do not possess the *petites perceptions* that are involved in the actual infinity of the cognition of the world. All sense impressions, however, must express this infinity and must thus possess a *je ne sais quoi*—something that renders them incommunicable to a person lacking the relevant sensory capacity. This aspect of the limited communicability seems to characterize the *je ne sais quoi*: if I believe a poem or a picture is done well or badly, I can show the work to you, but I cannot persuade you on the basis of reasons that this is the case. I may expect you to share in my judgment, for I am certain of its correctness, but the dependence of my judgment on confused perceptions means that I can never provide rational grounds for assent. Leibniz’s account of the *je ne sais quoi* thus anticipates Kant’s claim in the *Critique of Judgment* that judgments of beauty cannot be brought under determinate concepts. While Leibniz is often considered the founder of the “rationalist tradition” in aesthetics, the incommunicability of the *je ne sais quoi* implies that the story is more complex: it is not merely that Leibniz recognizes that there *is* something “irrational” in

aesthetic contemplation, but, more strongly, he holds that our inability to account fully for judgments of taste is due to an essential feature of our perceptual apparatus.

2.4 The complex perceptual state composed of *petites perceptions* merely appears to be simple.

Simple ideas might seem to provide a counterexample to Leibniz's thesis that all of our ideas are composed of an infinity of smaller ideas. When I perceive a green object, for instance, I am not aware of my perception as composed from blue and yellow, but as a simple, well-demarcated quality. Leibniz recognizes this problem and offers a solution regarding the *composition* of each of our phenomenally simple states out of a multiplicity of confused perceptions: "maintenant que nous avons la parfaite analyse du vert en bleu et jaune, et n'avons presque plus rien à demander à son egard que par rapport à ces ingrediens, nous ne sommes pourtant point capables de demeler les idées du bleu et du jaune dans notre idée sensitive du vert, pour cela même, que c'est une idée confuse" (§4.6.7; GP 5:384; NE 403).³⁸ Leibniz denies that any of our ideas are simple in themselves and attributes their *appearance* of simplicity to the result of "confusion." Leibniz opposes the Lockean claim that some ideas are simple with a model of ideas as inherently complex. All ideas—even, I shall argue, *petites perceptions* themselves—are

³⁸ See Simmons's discussion of this point in "Changing the Cartesian Mind", 61–66. She explains that our perceptions are really complex but appear *as* simple, because they are confused (noting that "confusion" here does not line up with the distinction between confused and clear ideas, because sensations are clear). Her explanation for the appearance of simplicity in our ideas is importantly disanalogous with her explanation of the way in which consciousness arises. Whereas, on her reconstruction, consciousness is *grounded* in states obeying the law of continuity, the simplicity of our ideas merely reflects the way in which they appear to us. This *appearing as* differs from a grounding relation, because *appearing* is only phenomenal.

divisible without end. This is already suggested by Leibniz's analogy between *petites perceptions* and imperceptible corpuscles. Leibniz repeatedly asserts that *petites perceptions* are the insensible corpuscles of the mind and that we have just as little reason to deny their existence as to deny that of material corpuscles (NE Preface 56; GP 5:49). But just as insensible bodies are not atoms because matter is divisible into infinity, perceptions—however minute—are never simple. If there were minimal units of perception, there would be “gaps” in nature. In addition to this argument from the law of continuity, Leibniz's definition of perception as expression—as possessing a structure isomorphic to that which is expressed—implies that perceptions, as structures, must be complex.

The example of apparently simple ideas such as color terms, however, is also noteworthy because it raises the problem of the phenomenal sorites.³⁹ This is a particular version of the problem of soritical series for vague predicates—such as “bald” or “heap”—that arises in the case of predicates denoting phenomenal properties such as hues of a color. Color hues form a dense series—between any two hues, there is an intermediate hue, yet there is a minimal threshold below which we cannot perceive the difference between two colors. As far as we can tell, two hues of a color that vary by an amount under this threshold are identical. If we construct a series of hues, each varying from the next by a degree falling under the threshold of awareness, we can pass from one hue to a completely different one—from green to blue, for instance. It seems, then, that we must either deny the transitivity of the indistinguishability relation for phenomenal

³⁹ My presentation of the problem here is indebted to Delia Graff Fara's excellent article “Phenomenal Continua and the Sorites,” *Mind* 110 (2001): 905–940. Graff Fara argues that phenomenal indiscriminability is transitive and that we must instead deny the possibility of constructing any sorites series. For a critique of Graff Fara's view, see Rosanna Keefe, “Phenomenal Sorites and Looking the Same,” *Dialectica* 65 (2011): 327–344.

qualities or deny that such a series can be constructed. Both options face serious problems. Phenomenal sorites paradoxes arise because, at least for certain kinds of properties, it does seem that continuous properties somehow generate or ground discrete properties. For Leibniz, this is a form of the labyrinth of the continuum. While he does not specifically address phenomenal sorites paradoxes, the questions he confronts are of a fundamentally similar nature. Leibniz offers an intriguing remark concerning the vagueness of color terms in the context of a more general discussion of sorites paradoxes in his discussion “des Noms de Modes mixtes et des Relations” (§3.5, GP 5:279) in the third book of the *New Essays*.

Leibniz sometimes claims that the vague notions generating a sorities series are “indeterminate”—nature does not fix their boundaries. This applies, Leibniz writes, even to the simple ideas of color:

... c'estoit un des Sophismes des anciens quand on pousse son adversaire, *Dum cadat elusus ratione ruentis acervi*. Mais la veritable reponse est que la nature n'a point determiné cette notion et que l'opinion y a sa part, qu'il y a des personnes, dont on peut douter, s'ils sont chauves ou non, et qu'il y en a d'ambigues qui passeront pour chauves auprès des uns, et non pas auprès des autres, comme vous aviés remarqué qu'un cheval, qui sera estimé petit en Hollande, passera pour grand dans le pays de Galles. Il y a même quelque chose de cette nature dans les idées simples, car je viens d'observer que les dernieres bornes des couleurs sont douteuses (§3.5.9, GP 5:281, NE 302)⁴⁰

⁴⁰ In his analysis of this passage, Samuel Levey argues that without some as yet undiscovered semantics for indeterminate terms, this indeterminacy thesis must commit Leibniz either to the denial of bivalence or to the endorsement of nihilism about vague terms. Since Leibniz clearly endorses bivalence, Leibniz's “indeterminist position must amount to nihilism, even if the distinctively *nihilist* element in nihilism—the denial that vague notions are ever true of anything—is no longer so salient in his remarks.” Levey, “Leibniz and the Sorites,” *Leibniz Review* 12 (2002): 25–49 (quotation at 38). See also Timothy Williamson's brief remarks about the *New Essays* in his *Vagueness* (London: Routledge, 1994), 33–34. As Williamson notes, “Unlike the Stoics, Leibniz holds that some of the questions in a sorites interrogation do not have right and wrong answers. The indeterminacy would remain even if we were perfectly acquainted with the inner natures of the creatures in question. Our inability to answer is not simply a product of ignorance” (34).

Leibniz's explanation here suggests an analogy between the indeterminacy of terms and the indefiniteness of idealities. Both kinds of notions are "imaginary" in the sense that some aspect of them—for the former, their application to borderline cases; for the latter, their real divisions—is not provided "by nature." On the other hand, in his later discussion of monsters—where the boundaries between species appear to violate classification—Leibniz seems to hold that nature does determine the boundaries for species, even if we are ignorant of such boundaries.⁴¹ But one might wonder why Leibniz does not endorse the thesis that nature fixes the extension of terms such as "bald" and "heap."⁴² Careful attention to Leibniz's solution to the labyrinth of the continuum can distinguish between those cases in which the world, in his view, determines the boundaries of our concept and those cases in which the vague terms contain something "imaginary." Leibniz does not have a unified semantic theory of vagueness because the

⁴¹ This would be, Levey remarks, a form of "content externalism," "for the world 'outside of us' finally determines where the boundaries of those notions fall, not just our knowledge or understanding of that world." Furthermore, "a kind of 'realism' about the things being divided accompanies this externalism about content: in a particular domain, say that of men and beasts, the world is divided up independently of our actual knowledge or understanding of its divisions." "Leibniz and the Sorites," 39.

⁴² Levey concludes that no interpretive option is particularly attractive but that the important point is Leibniz's view of vagueness as indeterminacy: "Vague notions do not determine sharp boundaries; their 'essences' are imperfect and the world outside us does not assign them boundaries either. Vagueness is at bottom a form of indeterminacy, and hence it cannot be a feature of anything as it is in itself. The essence of a vague notion is not to divide reality but rather, at best, only to appear to us. Vagueness is a fiction of the imagination." "Leibniz and the Sorites," 40. Levey considers several earlier texts in which Leibniz offers solutions to the problem of vagueness. In the 1676 *Pacidius Philalethei*, Leibniz appears to endorse a version of what is now called "epistemicism"—the view that vague terms have sharp boundaries although we are not aware of what they are. This seems to be akin to Leibniz's explanation of the monster case. In his 1678 essay, "Chrysippus' Heap," however, Leibniz claims that vague notions contain are "imaginary" (AA 6.4.69) a view he restates in the "Discourse on Metaphysics," where he claims that vague notions have a "hidden impossibility" (AA 6.4.1569; both quoted in Levey, "Leibniz and the Sorites," 39). Levey concludes from this variety of positions that Leibniz did not have a settled theory of vague terms and that he used soritical arguments tactically.

proper treatment of a particular vague term depends on whether the world determines the boundaries of that term—it depends on strictly *metaphysical* theses. Since Leibniz holds the metaphysical thesis that nature determines the boundaries of natural kind species, “epistemicism” is a more attractive position in this context, whereas predicates like “bald” seem to rely on some feature of the way in which things appear to us.⁴³ The question remains, however, whether Leibniz would claim that all terms that generate *phenomenal* soritical series are imaginary in this sense. While the problems concerning the generation of sharp divisions from continua of perceptions and perfections also arise from the labyrinth of the continuum, they must be distinguished from the problem of the composition of the continuum. Both, however, result from the application of the law of continuity, and we have considered the resources Leibniz has for exiting this labyrinth. I have suggested that the apparent difficulty regarding the composition of perceptual states out of *petites perceptions* is illusory: *petites perceptions* are not simples, but are, like all perceptions, complex structured wholes. Their minuteness must instead be understood in analogy to insensible corpuscles in physics, as Leibniz repeatedly urges. The resolution of the phenomenal sorites paradoxes is not so clear: Leibniz does not provide a full account of when nature creates, for instance, a genuine difference in kind.

3. Happiness and the Qualitative Infinite

Leibniz develops the concept of a dynamic account of the continuum of perfection in his explication of happiness. Happiness, according to Leibniz, involves both order and ever-

⁴³ According to epistemicism, “vagueness consists in our ignorance of the sharp boundaries of our concepts, and therefore requires no revision of standard logic.” Williamson, *Vagueness*, xi. See Williamson’s *Vagueness* for the classic defense of this view.

increasing activity. Wisdom, Leibniz writes in a manuscript dated by Gaston Grua to between 1694 and 1698, is the science of happiness, in so far as it teaches us to achieve happiness (Grua 584).⁴⁴ The text presents Leibniz's theory of certain states as containing an inherent tendency towards their own increase.

Two drafts of the text exist. The drafts diverge approximately halfway through the text, and this point of divergence marks a shift in Leibniz's argument from showing the structure of happiness to distinguishing between those pleasures that lead to happiness and those that do not. In the second to last paragraph of the section common to both drafts, Leibniz announces that from this text, one can see "wie Glückseligkeit, Lust, Liebe, Vollkommenheit, Wesen, Kraft, Freiheit, Uebereinstimmung, Ordnung und Schönheit an einander verbunden, welches von Wenigen recht angesehen wird" (E 2:672, KS 394). Leibniz's articulation of these ten terms proceeds by way of definitions following one from another. Happiness is itself defined as the "Stand einer beständigen Freude," a state or status of stability, a stable or standing joy (E 2:671, KS 393; compare Grua 584). The doubling of "Stand" indicates, however, an instability in the construction, the reasons for which become clear when Leibniz defines joy and pleasure: "Die *Freude* ist eine Lust, so

⁴⁴ "Von der Glückseligkeit" is one of relatively few philosophical texts that Leibniz composed in German. Gerhardt publishes the second version of the text as part of the sketches towards a universal characteristic, though without any information concerning Leibniz's reasons for writing in German (GP 7:86–90). Leibniz drafted, but did not publish, another text devoted to the same theme in French, which begins "La *Felicité* est un Estat durable de [contentement] plaisir" (Grua 2:579–584 at 579). For a general discussion of Leibniz's relation to the German language, see Yvon Belaval, "Leibniz et la langue allemande," in his *Études leibniziennes: de Leibniz à Hegel* (Paris: Gallimard, 1975), 25–36. Hans Heinz Holz, the editor of the Insel edition of Leibniz's works, cites the "expressiv kraftvolle[] Deutsch" as one of the reasons for the importance of the work. As an instance of this, he notes Leibniz's transposition of the Latin *realitas* into "Selbst-Wesen" (KS 389–390). Holz does not comment, however, on Leibniz's reasons for such a translation. The term "Selbst-Wesen" is particularly suitable for Leibniz, because *realitas* is for him not only the degree of essence, the presence of qualitative properties, but also the degree of the *self*, in the sense of a hierarchy of degrees of self.

die Seele an ihr selbst empfindet. Die *Lust* ist die Empfindung einer Vollkommenheit oder Vortrefflichkeit” (E 2:671, KS 391–392). The sensation of a perfection,⁴⁵ in turn, results in an increase in what Leibniz terms, in the first draft of the text, “Selbst-Wesen” (Grua 391). If, then, happiness is a state, status, or stability, it is one that only exists in and through a dynamics. The “Stand einer beständigen Freude” does not mean, Leibniz adds, the experience of joy in “alle Augenblicke” but involves a respite in contemplation and employment in “anständige Geschäfte.” To explain the remission required for constancy, Leibniz writes that happiness implies being “*in Stand*” to sense joy as often as one wishes to think of it. To be in this state is to have a potential which needs to be thought or acted upon to be fulfilled. The stability of joy is the potentiality to act and from this potential “eine Freudigkeit in seinem Thun und Wesen entsteht” (E 2:671, KS 391). Joyfulness is a tendency towards joy, where “tendency” already implies a force or impetus towards activity; it is an appetition. All monads have internal principles or appetitions, however, whereas joyfulness is the characteristic of those souls with the tendency to experience joy—that is, to increase their “Selbst-Wesen” or “reality.” Leibniz concludes his explanation of the particular kind of constancy of happiness by remarking: “Die gegenwärtige Freude macht nicht glücklich, wenn kein *Bestand* dabei, und ist vielmehr derjenige unglücklich, der um kurzer Freude willen in lange Traurigkeit verfällt” (E

⁴⁵ For a detailed and perceptive analysis of Leibniz’s theory of perfection, see Albert Heinekamp, *Das Problem des Guten bei Leibniz* (Bonn: Bouvier Verlag, 1969), 135ff. Heinekamp defends Leibniz against Max Scheler’s charge of “naturalism” and argues that Leibniz’s definition of perfection as the degree of reality does not simply reduce the ethical to properties of being, but instead gives a criterion for existence, whereby existence is the product of God’s action of choosing based on the degree of perfection or reality of essences. My discussion of perfections later in this text, and in particular the connection with the *Discourse on Metaphysics*, owes much to Heinekamp’s treatment of these questions.

2:671, KS 391). With this summary, Leibniz prepares for his distinction later in the essay among joys that lead to happiness and those that do not. The perpetuation of a present joy cannot, however, be its continuation, conceived of as the static possession of a property, but must be a tendency towards increase. The tension between constancy and change, where the perpetuation of joy is itself a type of change, a dynamic increase, is a consequence of Leibniz's analyses of pleasure, joy, and harmony.

Joy is a pleasure the soul takes in itself; pleasure is the "Empfindung einer Vollkommenheit." The sensation of perfection encompasses both the pleasures afforded by the senses and the intellectual or intelligible pleasures. Sensation is not to be understood as a passive recording or registering of a state. The sensation of a perfection, pleasure, involves an activity of the soul itself; when the soul senses a perfection, it thereby increases its own perfection. Leibniz insists on this even in the case of the sensation of outside perfections: "Denn das Bild einer solcher fremden Vollkommenheit in uns eingedrückt, macht, dass auch etwas davon in uns selbst geplanzt und erwecket wird" (E 2:671, KS 392). The implantation and awakening of a perfection within us further describes the active state or tendency involved in pleasure; by using the term "sensation" to describe pleasure, Leibniz does not renounce the fundamental activity characteristic of his metaphysics but rather uses this activity to interpret "sensation" as a growth in perfection. Indeed, "implantation" and "awakening" describe the process through which a type of perception, the sensation of a perfection, leads to a change in the perceiving soul, to its becoming more perfect. Thus, Leibniz describes the structure of pleasure as common to both joys, pleasures taken in the soul's own perfections, and

pleasures taken in external pleasures. Not only do both involve the reception of a perfection but, in the very “taking in” (*Einnehmung*) of the perfection, the soul becomes more perfect.

In *Von der Glückseligkeit*, Leibniz employs a distinction between the understanding and sensibility that seems at odds with his repeated assertions in other texts that sensory perception and thought belong to a scale of cognition.⁴⁶ In the first version of the essay, Leibniz writes, for instance:

Wir koennen an vielen dingen Lust haben, die wir angenehm finden, sowohl mit denen Sinnen zwar an schoenheit der gestalt, an suesser melody, an guthem geruch und geschmack, an zarter fuehlung, mit dem verstand an zusammenstimmung der unterschiedenen dinge, und mit einem worth an allem das eine vollkommenheit. (Grua 584, KS 391)

Now, according to the above, pleasure is found through both the senses and the understanding, so when Leibniz defines pleasure as an “*Empfindung*” of a perfection, this “sensation” applies equally to the understanding and the senses. This, along with Leibniz’s description of the transformative or active power of the sensation of pleasure, shows that his use of “*Empfindung*” does not correspond to sensory knowledge. This passage—as well as Leibniz’s use, particularly in the first draft, of the distinction between pleasures of the senses and pleasures of the understanding in order to differentiate between pleasures leading to happiness and those that do not—appears to imply that Leibniz posits the understanding and senses as separate faculties, as Kant would do, albeit faculties which

⁴⁶ For instance: “C’est peut-estre qu’on a crû que les pensées confuses different *toto genero* des distinctes, au lieu qu’elles sont seulement moins distinguées et moins développées à cause de leur multiplicité” (L 580; GP 4:563). See also Leibniz’s description of the scale of cognition in his *Meditations on Knowledge, Truth, and Ideas* (GP 4:422–426).

could both sense pleasure.⁴⁷ The basis of the distinction between pleasures of the senses and those of the understanding does not, however, lie in a doctrine of separate faculties but, rather, is based on the grounds of the pleasure:

Man merket nicht allezeit, worin die Vollkommenheit der angenehmen Dinge beruhe, oder zu was für einer Vollkommenheit sie in uns dienen, unterdessen wird es doch von unserm Gemüthe, obschon nicht von unserm Verstande, empfunden. Man sagt insgemein: es ist, *ich weiß nicht, was*, so mir an der Sache gefället, das nennet man *Sympathie*, aber die der Dingen Ursachen forschen, finden den Grund zum öftern und begreifen, dass etwas darunter stecke, so uns zwar unvermerket, doch wahrhaftig zu statten kommt. (E 2:671, KS 392; emphasis mine)

For a perfection to be sensed by the mind but not by the understanding is for it to be perceived without being noticed; however, Leibniz implies that such a pleasure can, at least in many cases, be made into a pleasure of the understanding by searching for the causes of the pleasure.⁴⁸ Leibniz's use of the phrase "ich weiß nicht was" to describe sympathetic pleasures is echoed in his discussion of *petites perceptions* in the Preface to the *New Essays*, considered in section two.

Leibniz considers the grounds for the pleasure we take in music in order to illustrate his claim that the pleasures of the senses can be traced to perfections that are

⁴⁷ Kant's central complaint against Leibniz—or, at least, the Leibnizian-Wollfian school philosophy—was that he "intellectualized appearances," that is, viewed the difference between sensibility and the understanding as a matter of degree rather than kind. In light of Leibniz's repeated commitments to the continuity or scale of cognition, it seems to me that, despite the passage cited, Leibniz does not posit different faculties of understanding and sensibility. Robert McRae argues, however, that Leibniz does formulate a difference in kind between the sensibility and the understanding: "Sense perception is not confused thought, even although [sic] it never exists apart from the clear, but confused idea of possibility." McRae, *Leibniz: Perception, Apperception, and Thought* (Toronto: University of Toronto Press, 1976), 129; compare the discussion at 126ff. McRae does not, however, explain the passages—which he nevertheless cites—in which Leibniz clearly seems to endorse the scale of cognition. McRae appears to want to defend Leibniz against Kant's charge, but he simply presupposes the correctness of the Kantian claim that there is a difference in kind between the understanding and sensibility.

⁴⁸ Cf. Leibniz's distinction between perception and apperception in the *New Essays* §2.9.4, GP 5:121 and his discussion of the role of attention there.

sensed by the soul and thereby increase the soul's own perfection.⁴⁹ Music does not simply serve as an example here, however, for the analysis of the pleasure derived from music allows Leibniz to introduce a theory of harmony and order that is the lynchpin of his account of pleasure.⁵⁰ The case of music, moreover, provides a clue as to Leibniz's theory of the dynamics of harmony, for the analysis of music leads Leibniz to his final definition of perfection in terms of force and unity of the many in the one.

He writes that “[a]lles, was klinget, hat eine Bebung oder hin und her gehende Bewegung in sich, wie man an den Saiten siehet ... ” (E 2:671, KS 392). This movement, the *vibratio tremulo*,⁵¹ must be “in sich”; for this motion will awaken an echoing vibration in the soul itself. Since the soul is immaterial, however, its tremulous vibration cannot be a change of position or location. Indeed, since quantitative, extensive, relational properties are, for Leibniz, reducible to intensities or qualities, this “vibration,” when descriptive of the soul, must refer to a force. The dynamics of an immaterial soul is the science of movement of that which, as immaterial, cannot move at all. Yet, despite the appearance of paradox, it is only that which cannot move, that which is immaterial, that is the true subject of a dynamics, for every ultimate principle of activity must be a

⁴⁹ See Daniel Heller-Roazen, *The Fifth Hammer: Pythagoras and the Disharmony of the World* (New York: Zone, 2011), 83–88 for Leibniz's theory of musical harmony. As Heller-Roazen points out, Leibniz's theory of unconscious representations allows him to provide a theory of the pleasure we take in musical consonances.

⁵⁰ For an overview of the different senses of harmony in Leibniz, as well as an analysis of some of the systematic implications of this concept, see Yvon Belaval's article, “L'harmonie” in his *Études leibniziennes: de Leibniz à Hegel* (Paris: Gallimard, 1976), 86–105. For a survey of the different uses of harmony prevalent in the seventeenth century, with particular emphasis on the cosmological theories of Kepler and Giordano Bruno, see chapter eight of Leroy Loemker's *Struggle for Synthesis: The Seventeenth Century Background of Leibniz's Synthesis of Order and Freedom* (Cambridge: Harvard University Press, 1972), 177–202.

⁵¹ Grimm provides *vibratio tremulo* as a definition of “Bebung.” See Jacob and Wilhelm Grimm, *Deutsches Wörterbuch* (Leipzig: S. Hirzel 1854–1960), s.v.

simple substance, and a simple substance cannot be material, because matter is necessarily multiple. Before explaining this force of the soul, Leibniz describes how the sensation of a “Bebung” in music increases the soul’s perfection through a series of descriptions of the physics of music and poetry: “also was klinget, das thut unsichtbare Schläge, wenn solche nun nicht verwirret, sondern ordentlich gehen, und mit gewissen Wechsel zusammentreffen, sind sie angenehm ...” (E 2:671, KS 392). Pleasure thus has two aspects: it requires change or alternation (*Wechsel*) but an “ordentlich” form of change.

He compares the alternation producing the pleasure of sound with that of verse: “wie man auch sonst einen gewissen Wechsel der langen und kurtzen Silben und Zusammentreffen der Reimen bei den Versen beobachtet, welche gleichsam eine stille Musik in sich halten, und wenn sie richtig, auch ohne Gesang angenehm fallen” (E 2:671, KS 392–393). The alternation of short and long syllables forms a silent but also motionless music. In the next sentence, Leibniz invokes orderly movement to explain the pleasure of drumming and dancing, describing such movement as producing in the air a “gleichmäßige Regung,” which causes “einen mitstimmenden Widerschall ... nach welchem sich auch unsere Lebensgeister regen” (E 2:671, KS 393). The term “gleichmäßige Regung” means not only uniform motion but also describes a gradual stirring or awakening in our “Lebensgeister.” Leibniz uses these two senses of “Regung” to explain the connections among vibration, reverberation, and the movements of the soul. Music—and rhythm more generally—is pleasurable because its “Stimmung” is in tune with and heightens the “movement” of the soul: “Daher die Musik so bequem ist, die Gemüther zu bewegen” (E 2:671, KS 393). The example of the atunement between

sonic vibrations and those of our “Lebensgeister” illustrates how the sensation of a perfection leads to the increase of the perfection of the soul, namely by a “Regung” resulting in a “mitstimmende Widerschall” or “Bewegung” of the “Lebensgeister.” In the next paragraph, Leibniz reiterates that the pleasures of the senses derive from an invisible order and perfection, which exists to stimulate (“reizen”) the souls of man and animals. Leibniz’s explanation for this movement begins with his definition of perfection as the “Erhöhung des Wesens.” Leibniz’s theory of the elevation of the soul is based upon a scale of perfections varying in intensity. To elevate the soul is to intensify its degree of perfection, to bring it closer to the qualitatively infinite perfection of God.

In the first paragraph of the *Discourse on Metaphysics* (1686), Leibniz gives a test for whether a property is a perfection. The test draws on the distinction between extension and intensity, demonstrating that perfections must be intensive qualities. They cannot be composed from parts:

Il faut connoistre aussi ce que c’est que perfection, dont voicy une marque assés seure, scavoir que les formes ou natures, qui ne sont pas susceptible du dernier degré, ne sont pas des perfections, comme par exemple la nature du nombre ou de la figure. Car le nombre le plus grand de tous (ou bien le nombre de tous les nombres), aussi bien que la plus grande de toute les figures, impliquent contradiction, mais la plus grande science et la toute-puissance n’enferment point d’impossibilité. Par consequent la puissance et la science sont des perfections, et en tant qu’elles appartiennent à Dieu, elles n’ont point de bornes. (§1, GP 4:427)

Leibniz’s claim here is that quantities such as number or figure cannot have a highest degree and therefore are not perfections. Extensive quantities involve treating parts as homogeneous, abstracting from the differences in individuals, and then making collections from these parts. As Leibniz reiterates in the *Nouveau essais*, however, the

infinite cannot be conceived of as a whole composed of parts. For Leibniz, the true infinite must be qualitative, and thus the principle of all perfections or realities is intensity.

In one of the rare passages from his later work to use the term “intensity,” Leibniz claims that there can only be a maximum degree of intensity and not of extension. This brief remark concerning perfections occurs in §11 of his 1698 essay, *De ipsa natura*, published in the *Acta Eruditorum* (AG 155–167; GP 4:504–516). After introducing the “atoms of substance” that must underlie all matter, Leibniz concludes that extensive magnitudes cannot have a maximum amount for the same reason that there can be no minimal units of extension:

For, although there are atoms of substance, namely monads, which lack parts, there are no atoms of bulk [*moles*], that is, atoms of the least possible extension, nor are there any ultimate elements, since a continuum cannot be composed out of points. In just the same way, there is nothing greatest in bulk nor infinite in extension, even if there is always something bigger than anything else, though there is a being greatest in the intensity [*intensio*] of its perfection, that is, a being infinite in power [*virtus*]. (AG 162)⁵²

Nothing composed of parts outside one another can possess either an absolute minimum or maximum. The scale of perfections, however, does terminate in a highest degree: God. Unlike extensive magnitudes, intensive magnitudes can reach a highest point. For Leibniz, both extensive and intensive magnitudes can be increased to infinity, but whereas the extensive infinite never reaches a final degree, the “qualitative” infinite constitutes an endpoint.

⁵² GP 4:511: “Etsi enim dentur atomi substantiae, nostrae scilicet Monades partibus carentes, nullae tamen dantur atomi molis, seu minimae extensionis, vel ultima elementa, cum ex punctis continuum non componatur, prorsus uti nullum datur ens mole maximum, vel extensione infinitum, etsi semper alia aliis majora dentur; sed datur tantum ens maximum intensione perfectionis, seu infinitum virtute.”

First, however, Leibniz must respond to the objection that the intensive magnitudes with which we are familiar—sensible qualities such as whiteness or brightness—cannot be increased to infinity, because they have a *finite* maximal degree. In the *New Essays*, Philalethes contrasts intensive and extensive magnitudes, claiming that whereas extensive magnitudes can be increased by adding parts, intensities cannot be increased by additional smaller intensities of the quality: “Si à la plus parfaite idée que j’ay du blanc le plus éclatant, j’en adjoute une autre d’un blanc egal ou moins vif ... cela n’augmente ny etend mon idée en aucune manière; c’est pourquoy on nomme *degrés*, les différentes idées de blancheur” (§2.17.6, GP 5:145; NE 158). This remark is based on the observation that a quality does not increase in intensity when lesser amounts of the quality are combined with it. Increase in degree does not follow the model of addition. Philalethes assumes that addition is the only model of increase and that, therefore, intensities reach finite maxima. But Theophilus responds that this objection does not pertain to intensive magnitudes as such but only to those which are sensibly perceived and that intensification can occur to infinity. Intensification—heightening—has a different structure from addition:

Je n’entends pas bien la force de ce raisonnement, car rien n’empeche qu’on ne puisse recevoir la perception d’une blancheur plus éclatante que celle qu’on conçoit actuellement. La vraye raison pourquoy on a sujet de croire que la blancheur ne sauroit estre augmentée à l’infini, c’est parceque ce n’est pas une qualité originale; les sens n’en donnent qu’une connoissance confuse; et quand on en aura une distincte, on verra qu’elle vient de la structure, et se borne sur celle de l’organe de la veue. Mais à l’égard des qualités originales ou connoissables distinctement, on voit qu’il y a quelques fois moyen d’aller à l’infini non seulement là, où il y a *extension* ou si voulez *diffusion* ou ce que l’ecole appelle *partes extra partes*, comme dans le temps et dans le lieu, mais encor où il y a intensification ou *degrés*, par exemple à l’égard de la vitesse. (§2.17.6, GP 5:145–146; NE 159)

The limitation comes from our sense organs, not from the nature of intensive magnitudes. The model of increase in intensity differs from that of adding one part to another, but it is no less capable of going to infinity. Indeed, Theophilus will go on to remark, we can form a positive concept of this sort of “absolute,” qualitative infinite—for example, in our concepts of immensity and eternity (§2.17.6, GP 5:146, NE 159).

Heinekamp offers an explanation for Leibniz’s use of the concept of “absolute”:

Von den Voraussetzungen der Leibnizschen Ontologie aus können die Attribute, bei denen es einen höchsten Grad gibt, absolut genannt werden, da sie das Sein der Monaden selbst betreffen, während alle Eigenschaften, die sich auf die Phänomene beziehen (z. B. die quantitativen Bestimmungen), relationalen Charakter tragen. Nur die Attribute können zu den Vollkommenheiten gerechnet werden, die nicht nur positiv (oder affirmativ), sondern auch absolut im oben erläuterten Sinne sind.⁵³

This explanation seems to fit the account given here: “absolute” properties are qualitative determinations that can have greatest degrees, because they do not involve the abstraction and composition of parts. Relational properties pertain merely to phenomena and thus cannot be perfections. The only difficulty with this account—and it pertains equally to Heinekamp’s summary and to the explanations of the passage from the *Discours* given here—is that the principle of order is itself relational: order is first and foremost simply the relation of unity within diversity. For Leibniz to insist upon a principle of order or of continuity is for him to insist upon relation as the very definition of perfection. We thus seem faced with a tension in Leibniz’s account: he claims both that relational properties consist in abstractions from the real, qualitative properties of monads and that all pleasure—all sensation of perfection—comes from a relation but is fully real. This tension

⁵³ Heinekamp, *Das Problem des Guten bei Leibniz*, 148.

indicates that a distinction must be made in the notion of relation. As we have seen, Leibniz does not ban all relations from the realm of the real but rather distinguishes between ordinary relations and an intramonadic order of relation called “force.” In fact, the theory of force can be interpreted as the introduction of a new form of real relation, consisting in the unity of the many within the one.⁵⁴

Leibniz’s account of force in *Von der Glückseligkeit* focuses on a different aspect from that considered in the *Système nouveau*. While both texts consider force as a unification within the one of a many, here Leibniz emphasizes the role of increase or growth in his definition of perfection as “alle Erhöhung des Wesens.” He is interested in setting up a scale of forces, of degrees of unification, in order to explain happiness as the increase of force. He remarks that just as sickness involves a diminution, so perfection is a “Steigerung” over health, the basis for which lies in health itself, that is, in the mean or middle. This scale is itself defined by the degree of force or activity:

Gleichwie nun die Krankheit herkommt von verletzter Wirkung, wie solches die Arzney-Verständige wohl bemerket, also erzeiget sich hingegen die Vollkommenheit in der Kraft zu wirken, wie denn alles Wesen in einer gewissen Kraft besteht, und je größer die Kraft, je höher und freier ist das Wesen (E 672, KS 393)

When the soul increases its perfection, it heightens its power to act; it becomes more itself, since its essence consists in force, a power to change. As we have seen already in Chapter 1, force as the activity of representing is the foundational concept of Leibniz’s

⁵⁴ Heidegger focuses on this aspect of Leibniz’s account of substance in the excerpt of his 1928 Marburg lecture course published in *Wegmarken*. See “Aus der letzten Marburger Vorlesung” in *Wegmarken* (Frankfurt: Klostermann, 1976), 79–101. As Heidegger notes, the monad essentially unifies and unifies that which is not foreign to it but which it itself anticipates: “Das konsitutive Prinzip der Einigung muß früher sein denn das, was der möglichen Einigung untersteht. Das Einigende muß *voraus* sein, es muß vorweg auslangend sein nach etwas, von wo aus jedes Mannigfaltige schon seine Einheit empfangen hat” (92).

account of substance, and force has an intensity or degree. Accordingly, it is misleading to consider a perfection simply as a positive predicate possessed by a subject, for this description does not capture, first, the role of the account of perfection in Leibniz's metaphysics, and, second, the character of a perfection as a tendency towards action. Perfections, like perceptions, must always have an appetitive dimension. When a soul has a quality, according to Leibniz, it must also possess a tendency towards action, towards effect.

In addition to this foundational account of perfection as a tendency towards the increase of force, Leibniz introduces several distinctions in order to reconcile an apparent tension between force—an essential determination of substance—as a “permanent” property of the substance and force as involving increase and thereby change. First, Leibniz distinguishes between primary and derivative force. All monads have both primary force, “entelechy,” which is a “permanent” property of action that makes up the essence of substance, and “derivative” force, which is a modification of the primary force. In paragraph eighteen of the *Monadology*, after explaining that monads must have a “principle of change” and a “diversity in that which changes,” Leibniz introduces the term “entelechy”: “On pourroit donner le nom *d’Entelechies* à toutes les substances simples ou Monades créées, car elles ont en elles une certaine perfection (ἔχουσι τὸ ἐντελές), il y a une suffisance (αὐτάρκεια) qui les rend sources de leur actions internes et pour ainsi dire des Automates incorporels” (GP 6:609–610, AG 215). Leibniz refers the reader to section 87 of the *Theodicy*, where he considers Aristotle's distinction between

two types of action: permanent and successive action.⁵⁵ Leibniz explains that because substantial form is permanent, it must contain “non seulement une simple faculté active, mais aussi ce qu’on peut appeller *Force, effort, conatus*, dont l’action même doit suivre, si rien ne l’empêche” (§87, GP 6:150, T 170). Here, Leibniz summarizes the modification of the Aristotelian doctrine of potentiality that he undertakes in the *Système nouveau*. For Leibniz, as we have seen, primary force or entelechy must be a tendency or push⁵⁶ towards action; it is a permanent “active principle” that underlies the unfoldings of the monad in successive acts. As a permanent principle, possessed by monads in different degrees and defining their individuality, it does not seem that this primary force can increase or diminish in happiness or sickness. Leibniz must, therefore, be referring to secondary or derivative force in his account of the increase or decrease of force in the sensation of perfection.

This force varies in its power to unify a multiplicity, as Leibniz specifies in the next sentence: “Ferner: Bei aller Kraft, je größer sie ist, je mehr zeigt sich dabei *Viel aus einem und in einem*, indem Eines Viele ausser sich regieret und in sich vorbildet” (E 2:672, KS 393–394). As in his previous formulations, Leibniz is concerned here not only with

⁵⁵ In the first part of section 87, Leibniz discusses the relation between “entelechy” and “perfection”: “Aristotle et l’Ecole apres luy ont appellé *Forme*, ce qui est un principe de l’action, et se trouve dans celui qui agit. Ce principe interne est ou substantiel, qui est appellé *Ame*, quand il est dans un corps organique, ou accidentel, qu’on a coutume d’appeller *Qualité*. Le même Philosophe a donné a l’Ame le nom generique d’Entelechie ou d’Acte. Ce mot, Entelechie, tire apparemment son origine du mot Grec qui signifie parfait, et c’est pour cela que le celebre Hermolaus Barbarus l’exprima en Latin mot à mot par *perfectihabia*, car l’Acte est un accomplissement de la puissance; et il n’avoit point besoin de consulter le Diable, comme il a fait, à ce qu’on dit, pour n’apprendre que cela” (*Theodicy*, §87, GP 6:150, T 169–170). Compare Heidegger’s discussion of this translation of Aristotle in the Renaissance, “Aus der letzten Marburger Vorlesung,” 84.

⁵⁶ Heidegger terms it a *Drang* and emphasizes this aspect of Leibniz’s departure from Aristotle; see “Aus der letzten Marburger Vorlesung,” 92.

defining force but with defining the increase of force as the substance becoming more fully itself—heightening its “Selbst-Wesen.” Leibniz’s definition of the growth of force has two parts: there are both many “aus einem” and “in einem.” Leibniz begins to explain this double relation in the second part of his definition, where the one *out of* the many would be the ruling (“regieret”) of the many “outside it” by the one, and the many *in* the one would be the representation of the many within the one (“in sich vorbildet”). Force involves a projection or reaching outside of itself and a gathering, or representation, within itself. This relation of the one to the many involves a double movement, a reaching or extension of itself, of a unity, into the many, and the contraction of the many into the one. Leibniz continues: “Nun die Einigkeit in der Vielheit ist nichts anders als die Uebereinstimmung, und weil eines zu diesem näher stimmt als zu jenem, so fließet daraus die Ordnung, von welcher alle Schönheit herkommt, und die Schönheit erwecket Liebe” (E 2:672, KS 394). The double movement of unification is encapsulated in the term “Übereinstimmung,” which should be understood not only in its common translation as “agreement” but as a harmonization of the many, or as making the many “sound together” as one. The term recalls Leibniz’s earlier discussion of music, where an orderly movement of strings, a *vibratio tremulo*, described the movement of the soul. When the soul senses a perfection, it senses a harmonization or sounding-together of many in one. This sensation of “Übereinstimmung” or order awakens, stimulates, and resonates with the order in the soul, whose essence consists in force, the unifying of the many in the one. This harmony between the outer and the inner agreement leads the soul to feel pleasure, which is itself a heightening of force. Now, Leibniz writes, we can see how

“Glückseligkeit, Lust, Liebe, Vollkommenheit, Wesen, Kraft, Freiheit, Uebereinstimmung, Ordnung und Schönheit an einander verbunden [sind]” (E 2:672, KS 394). The principle that allows these terms to be reconciled, according to Leibniz, is the relation between the many and the one, which he determines as the working of force. “Einigkeit in der Vielheit” is not a simple binding together of the many into the one or a becoming-more-unified, but instead involves an increase both in the multiplicity and in its agreement with the one. Both multiplicity and harmony must be heightened to avoid a collapse into a simple stillness. Multiplicity is increased in so far as the one reaches outside of itself to rule over the many; unity is increased in so far as there is a second moment in which the many is presented within the one, that is, within “representation.”

For Leibniz, to be happy is to increase perfection continuously, to heighten one’s force in time. This is best done, however, by imitating that which has the highest degree of perfection, God. Through the contemplation of this highest degree of perfection, one continually (“beständig”) approaches it. God functions as an unreachable limit towards which the finite creature strives. The happiness of a finite creature multiplies with its power:

Erscheinet also die hohe Glückseligkeit höher und dabei erleuchteter Personen daraus, dass sie zu ihrer Glückseligkeit so viel tun können, als wenn sie tausend Hände und tausend Leben hätten, ja als wenn sie tausend mal so lang lebten, als sie tun. ... Der nun viel thut in kurzer Zeit, der ist dem gleich, so 1000 mal länger lebt; welches bei denen Statt findet, so machen könne, dass 1000 und aber 1000 Hände mit ihnen wirken, dadurch in wenig Jahren mehr Gutes geschehen kann zu ihrem höchsten Ruhm und Vergnügen, als sonst viel hundert Jahre nicht bringen könnten (E 2:673, KS 401)

This is a dizzying arithmetic of force, in which the power of the “high” bestows them with first a thousand and then “aber 1000” hands, lives, and years. As Leibniz writes in

the last line, the “true happiness,” that which arises from wisdom and virtue, exceeds all limit and measure: it is “ganz überschwenglich und unermeßlich” (E 2:673, KS 401). The goal and source of this infinitely increasing, ever-expanding force is, however, an absolutely highest entity. God is, Leibniz writes, the “höchste Gut” and the most perfect being, but how is it possible for there to be a highest degree of force, when—as we have just seen—force seems to increase infinitely?

According to the arguments in both the *Discourse on Metaphysics* and *Von der Glückseligkeit*, there is one type of infinity compatible with the possession of a highest degree. As we have seen, Leibniz distinguishes between the quantitative and qualitative by saying that while quantity can be extended indefinitely and thus is always potentially infinite, qualities submit of a highest degree. Since only qualities are perfections, we can argue that God possesses the highest degree of all perfections. But is the highest degree of these qualities finite or infinite? If we consider the infinite as consisting in a never-ending capacity for expansion, then there could never be a highest degree or completed infinite perfection. Nor, however, can the highest degree of a perfection be finite, since for something to be finite implies that it is limited, that it does not encompass a totality. Leibniz thus writes in the first paragraph of the *Discours* that God’s power and knowledge must be both “la plus grande science et la toute-puissance” and have “point de bornes”: possessing the highest degree must consist in having no limitations. The possession of everything also involves a lack: the lack of a limit. The highest degree of a perfection must at once cover everything, must fill the *whole* of the objects susceptible to this quality, but it must also be an unlimited whole. The only possibility for conceiving of this would

be a completed infinite, an infinite that does not consist in a potential for expansion but already contains this expansion within itself. It is only if this is the case that we can conceive of God as possessing an infinite degree of force. Moreover, the difficulty of the problem seems only to be heightened when we consider how God could possess the highest degree of force. If any increase in force consists in an intensification of perception, in a greater “Einigkeit in der Vielheit,” then the highest degree of force can only consist in the greatest “Vielheit” unified by the one that is God. What, however, could the greatest “Vielheit” be? Even if one accepts this distinction between qualities and quantities, is not multiplicity quantitative, making the greatest degree of a force impossible? Just as Leibniz argues that a greatest number is impossible, should he not likewise deny that there could be an ultimate unification of the all within the perceptual powers of the one? Furthermore, in “Von der Glückseligkeit,” Leibniz argues that happiness consists in a perpetual heightening of force, but is not an increase of what is already the greatest impossible? Leibniz seems to rely upon the idea of a total force, of a highest degree, but to simultaneously make any such highest impossible, since it would not be compatible with the ever-increasing nature of a happy being. Leibniz must, then, maintain that the actual, completed infinity of force possessed by God contains within itself a potential—contains, that is, its own increase. This, perhaps, is why Leibniz does not write that God achieves the limit but rather that the highest degree has no limit. So, God attains not one state among others, but the “state” of having no boundary.

This “Einigkeit in der Vielheit” defines the intensive unity that underlies Leibniz’s metaphysics of substance. He conceives of a substance that is only one through

its ever-increasing unification of the many, through its forming or drawing the many together. As we have seen, this raises the question of how the totality of an infinite being could be possible, how there could be a “qualitative infinite,” and how this qualitative infinite would apply to force. The second question it raises, however, is how such a definition of the being of substance is applicable to finite creatures. How can there be a limitation, an unhappiness within being, when the only thing that seems to make something a being at all is its activity? Could the activity of created beings bear its own principle of limitation within itself?

4. Limits

As we have seen, in Leibniz’s monadological metaphysics, force constitutes the nature of substance. In the *Système nouveau*, Leibniz argues that only that which acts can truly be. He conceives of the activity of substances on the model of souls, describing their workings as containing “quelque chose d’analogique au sentiment et à l’appetit” (GP 4:479). Nearly twenty years later, in the *Monadology*, Leibniz again argues that the simples which comprise the true atoms of nature have an internal principle of change consisting in perceptions and appetitions. Monadic perceptions have degrees of distinctness proportional to the degree of perfection of the monad, and this degree of perfection is itself a degree of force. On the most basic level, it appears that the world Leibniz describes in the *Monadology* is fully exhausted by immaterial simple substances with powers of perception. What is the place of matter in this metaphysics of force? Does matter have reality above and beyond what is conferred by the monads? If we follow Descartes’s

conception of matter as extension, then matter will be reduced to a mere order of relations, an abstraction from the reality of substances.⁵⁷ Leibniz, however, describes two types of matter, primary and secondary matter, neither of which is reducible to extension. Secondary matter arises from the aggregation of substances and derives its being from the reality of the substances; primary matter is an aspect of simple substances. If the nature of simple substances lies in force, however, what could this primary matter be? Leibniz's answer is that primary matter is itself a type of force, what he terms "primitive passive force." In §49 of the *Monadology*, he equates the confusedness of a monad's perceptions with passion.⁵⁸ When a monad's perceptions are more confused than those of another monad, we can say that it is "acted upon" by the other monad, even though—as Leibniz specifies two paragraphs later—this action is merely "ideal" (AG 219; GP 6:615). Primary matter or passive force thus seems to be a description of monadic perception in so far as this perception fails to achieve its highest degree of clarity. What kind of principle is this "force"?

In a 1703 letter to Burchardus de Volder, Leibniz outlines his theory of the composition of corporeal substances: "I therefore distinguish: (1) the primitive entelechy

⁵⁷ See Descartes, *Principia philosophiae*, II, §4 (AT 8:42, CSM 1:221): "Naturam corporis non in pondere, duritie, colore, aut similibus; sed in sola extensione consistere."

⁵⁸ See "On the Method of Distinguishing Real from Imaginary Phenomena" (1683–86), where he writes: "Substances have metaphysical matter or passive power insofar as they express something confusedly; active, insofar as they express it distinctly" (L 365; GP 7:322). Daniel Garber marshals extensive evidence for the view that in the 1680s and 1690s, Leibniz's theory was far more Aristotelian than idealist. Garber argues that, in texts including the correspondence with Arnauld and a letter to Fardella from 1690, Leibniz holds the position that corporeal substances are the fundamental building blocks of reality. Furthermore, he claims that corporeal substances include something extended and that Leibniz posits primary matter that would not be reducible to form or force. See Garber, "Leibniz and the Foundations of Physics: The Middle Years," in Kathleen Okruhlik and James Robert Brown, eds., *The Natural Philosophy of Leibniz* (Dordrecht: Reidel, 1985), 27–130, especially 42–55.

or soul; (2) primary matter or primitive passive power; (3) the complete monad formed by these two; (4) mass or secondary matter, or the organic machine in which innumerable subordinate monads concur; and (5) the animal or corporeal substance which the dominating monad makes into one machine” (L 530–531).⁵⁹ The primitive entelechy and the primitive passive power are both aspects of the monad. Leibniz chooses the term “monad” to describe the fundamental metaphysical units of reality because the term refers to Plotinus’ term for “unity,” *monas*.⁶⁰ This “oneness” of the monad must not, then, be threatened by the seeming duality of the forces that comprise it: the primitive active and passive forces. Moreover, the term “passive force”—or, as Leibniz will gloss it elsewhere, the power to be affected—almost seems to involve a contradiction. What could it mean to have a power to *be* changed, to undergo or to suffer? Since force is fundamentally conceived of as an *activity*, what sense could it make to speak of a primitive passive force?

Leibniz confronts a related obstacle concerning another pair of principles. The difficulty arises from the problem of the origin of evil. The traditional problem follows from God’s nature and actions: if God creates and sustains everything, then it would seem that he is also the author of evil. But how could an omnipotent and omnibenevolent being cause sin? In a short dialogue from 1695 (Grua 361–69, AG 111–117), Leibniz

⁵⁹ GP 2:252: “Distinguo ergo (1) Entelechiam primitivam seu Animam, (2) Materiam nempe primam seu potentiam passivam primitivam, (3) Monada his duabas completam, (4) Massam seu materiam secundam, sive Machinam organicam, ad quam innumerae concurrunt Monades subordinatae, (5) Animal seu substantiam corpoream, quam Unam facit Monas dominans in Machinam.”

⁶⁰ Plotinus, *Enneads*, VI, 9, 3.

describes his solution to this problem.⁶¹ “A” represents Leibniz’s interlocutor, “B”

Leibniz’s own views:

A. ... d’où vient le peché dans le monde, puisque Dieu createur dum onde est infiniment bon et infiniment puissant. ? Pour rendre raison du peché, il faudroit une autre cause infinie capable de contrebalancer l’influence de la bonté divine.

B.—Je puis vous nommer une telle chose.

A.—Vous serés donc un Manicheen, par ce que vous admettez deux principes, l’un du bien et l’autre du mal.

B.—Vous me dechargerés vous meme de cette accusation du Manicheisme, quand je vous auray nommé cet autre principe.

A.—Nommés le donc presentement, Monsieur, je vous en prie.

B.—C’est le Neant. (Grua 363–364, AG 113)⁶²

Leibniz’s interlocutor is suitably puzzled as to how nothingness could be an infinite principle capable of explaining the existence of evil, but B replies that “la cause du bien est positive, mais ... le mal est un défaut, c’est à dire une privation ou negation, et par consequent vient du neant ou non estre” (Grua 364, AG 114). When A requests that B

⁶¹ See also, of course, Leibniz’s extensive discussions of this problem in the *Theodicy* (§118–119, T 188–190, GP 6:168–172). I consider the earlier dialogue rather than the *Theodicy*, because Leibniz formulates his solution more sharply in the earlier text. See also the *Confessio Philosophi* (1673), where Leibniz derives the problem of God’s responsibility for sin from the principle of sufficient reason. The objection reads: “Peccatum a potentia et voluntate. Potentia a Deo, voluntas ab opinione; Opinio a temperamento simul et objecto. Utrumque a Deo, ergo omnia peccati requisita a Deo, ergo peccati ut aliarum rerum omnium, ergo et damnationis ultima ratio Deus est. Vides quid ex illo theoremate sequatur, *Nihil est sine ratione*” (CP 46–47). See *Monadology*, §42 (GP 6:623–624; AG 224).

⁶² See also Sukjae Lee’s discussion of this passage in “Leibniz on Divine Concurrence,” *Philosophical Review* 113 (2004): 204–248 at 209–211. Lee uses this passage to argue against Robert Sleight’s view that God is responsible for creatures’ perfections, while creatures contribute their imperfections. Lee points out that in denying a Manichean account of imperfection as arising from a separate principle, Leibniz precludes any account that would attribute perfection and imperfection to different sources, and “on Sleight’s picture, perfections and limitations seem to be distinctive elements originating from different sources, which combine to produce a given state of a creature. God acts as the active force producing perfections, while the creature acts as the passive force producing imperfections or limitations, counterbalancing the perfections produced by God” (209). Lee argues that whatever Leibniz’s concurrentism consists in, it cannot rely on a separation of the principles of perfection and imperfection. See Robert Sleight, *Leibniz and Arnauld: A Commentary on Their Correspondence* (New Haven: Yale University Press, 1990), 183–185.

explain himself more clearly, B replies that “toutes les creatures sont limitées,” and these limitations are merely something negative (Grua 364, AG 114). Only God possesses the highest degree of perfection, and thus only he is unlimited. Imperfection and sin are a necessary result of the finitude of created substances. Thus B disputes that evil is the result of real opposition, the conflict of two forces of opposing directions that would counteract each other; he argues that rather than possessing a magnitude of its own, the principle behind evil must contain *nothing*, must be a principle of nothing. He offers the example of a circle to demonstrate that things are bounded “par le principe de la Negation ou du Neant qu’elles renferment” (Grua 364, AG 114). If we trace a circle with a compass, it is always limited; for, if the compass were larger, the circle would have been greater. Nevertheless, the limitation of the circle is not due to a force in opposition to the intrinsic essence of the circle. Rather, it is one and the same force—in this instance, the compass of particular dimensions—that both creates and limits the circle. Whatever magnitude the circle might have, it will be limited or imperfect, because every circle is a figure, as Leibniz writes, “terminé par sa circonférence” (Grua 365, AG 115). Leibniz argues that just as the nature of a circle requires it to be limited, so the nature of possible existents requires that all finite things contain a degree of imperfection. Since no creature possesses an infinite degree of perfection, every creature will lack perfection and will thus be susceptible to sin. He attributes this lack to the essence of the creature itself: a creature is imperfect not because God willed it to be so but because it is part of the nature of that creature to lack various perfections.⁶³ The principle of negation lies within the essence of

⁶³ Compare the reply of the Philosopher to the Theologian’s dilemma in the *Confessio philosophi*, 48–49: “Sentio igitur peccata [deberi] non *voluntati*, sed *intellectui* divino, vel quod idem

created beings, conditioning, limiting, determining them. Much as primary matter is a force of inactivity, so the principle of negation determines limitations without adding anything to the creature.

To reconnect this to Leibniz's account of primary matter, we need to recall that Leibniz identifies perfection with action. In §49 of the *Monadology*, he writes: "La Creature est dite *agir* au dehors en tant qu'elle a de la perfection, et *patir* d'une autre en tant qu'elle est imparfaite" (GP 6:615; AG 219). The distinction between active and passive correlates with that between perfection and imperfection. Creatures, then, have primitive passive force because they are imperfect, and their imperfection stems from their essential limitation, from their boundedness or finitude. If we follow Leibniz's suggestion in the *Dialogue on Freedom*, then primitive passive force arises from nothingness or non-being, not real opposition but privation. Leibniz develops this account in several passages from the *Theodicy* that bring together his theories of matter and evil. Leibniz's discussion of matter in the *Theodicy* relies upon his account of the effect of prime matter upon corporeal substances in the *Specimen of Dynamics* from 1695. Until now, I have considered primary matter in terms of the underlying perceptual features of monads. In the *Specimen of Dynamics* and many other texts, however, Leibniz discusses primary matter in terms of what results from it. In the *Specimen*, Leibniz aligns primary matter with a body's power of *resistance* and derives what he calls the "laziness" of bodies from it:

And indeed, the *primitive force of being acted upon* [*vis primitiva patiendi*] or of *resisting* constitutes that which is called *primary matter* in the schools, if

est, ideis illis aeternis, seu naturae rerum, ne quis somniet bina principia rerum, geminosque sibi inimicos Deos, alterum boni, alterum mali principium esse." The Philosopher then introduces arithmetical and geometrical examples to argue that whatever lies in the "ideas of things" is not ascribable to God's will.

correctly interpreted. This force is that by virtue of which it happens that a body cannot be penetrated by another body, but presents an obstacle to it, and at the same time is endowed with a certain laziness [*ignavia*], so to speak, that is, an opposition to motion, nor further, does it allow itself to be put into motion without somewhat diminishing the force of the body acting on it (AG 119–120)⁶⁴

As Leibniz remarks in this passage, the term “primary matter” originates in the scholastic interpretation of Aristotle, where it denotes matter apart from any form.⁶⁵ Although Leibniz certainly uses the form/matter distinction to explain the difference between primitive active and passive forces, he does not see prime matter as a substratum underlying all form. Leibniz instead characterizes primitive force here as a force of resistance, as a barrier or hindrance to motion or the force of another body. Following Kepler’s terminology, Leibniz describes the “laziness” that emerges from passive force as inertia. This characterization might appear to be in tension with our earlier analysis of passive force as privation—as if Leibniz were positing a real opposition not reducible to privation. At least by the *Theodicy*, however, Leibniz clearly conceives of inertia as mere privation. In fact, he uses this concept to explain the way in which evil could produce real effects, although it itself consists only in an absence of good. In §30 of the *Theodicy*, Leibniz writes:

⁶⁴ GM 6:234–254: “Et quidem *vis primitiva patiendi* seu *resistendi* id ipsum constituit, quod *materia prima*, si recte interpreteris, in Scholis appellatur, qua scilicet fit, ut corpus a corpore non penetretur; sed eidem obstaculum faciat, et simul ignavia quadam, ut sic dicam, id est ad motum repugnatione sit praeditum, neque adeo nisi fracta nonnihil vi agentis impelli se patiatur.”

⁶⁵ See, for instance, the discussion in Eustachius a Sancto Paulo: “[Matter] is distinguished into primary and secondary. Primary [matter] is said to be that which, before all else, we conceive as entering into the composition of any natural thing, regarded as lacking all forms. ...Secondary [matter] is said to be that very primary [matter], not, however, bare, but endowed with physical actuality [i.e., forms]” (Eustachius a Sancto Paulo, *Summa philosophiae quadripartita* (Cambridge, 1648), cited in Garber, “Leibniz and the Foundations of Physics,” 42).

Le celebre Kepler et apres luy M. des Cartes (dans ses Lettres) ont parlé de *l'inertie naturelle des corps*; et c'est quelque chose qu'on peut considerer comme une parfaite image et même comme un echantillon de la limitation originale des creatures, pour faire voir que la privation fait le formel des imperfections et des inconveniens qui se trouvent dans la substance aussi bein que dans ses actions. (GP 6:119, T 140)

That implies that even if he is willing to call inertia a force, he does not believe that this commits him to real opposition. If, indeed, inertia serves as a model for explaining evil as privation, then Leibniz's thesis in the *Dialogue on Human Freedom* that evil comes from the nothing applies to passive force. He compares creaturely imperfection with the movement of boats laden with cargo floating down a river. The boats that are more heavily laden will move more slowly, not, he remarks, because the weight of the cargo exerts a force contrary to the current but in virtue of what he calls the "receptivity" of matter: "C'est donc que la matiere est portée originairement à la tardivité, ou à la privation de la vitesse; non pas pour la diminuer par soy même, quand elle a déjà reçu cette vitesse, car ce seroit agir, mais pour moderer par sa receptivité l'effect de l'impression, quand elle le doit recevoir" (GP 6:120, T 140). Leibniz is trying to explain here how that which does not act can nevertheless have an effect upon force. Receptivity or passion—Leibniz uses both terms—moderates, shapes, delimits, or forms the impression of a force. There is, of course, a seeming tension in saying that the receptivity of matter forms something, but the dual sense of form, at once an active principle determining matter as well as the constraining aspect of matter, signals the complexity of Leibniz's account of limitation. Limitation, for Leibniz, consists both in the lack of a perfection and in the construction of a boundary that enables creatures to have shape. In the example of the circle from the *Dialogue on Human Freedom* considered earlier, it was only the boundedness of the circle,

resulting in its limitation or lack of perfection, that enabled it to have the form of a circle at all. As Leibniz writes, infinite circles are impossible, since infinity is contrary to their definition. While Leibniz's analogy between inertia and sin establishes that he thinks of both according to a model of privation and claims that both arise from a principle of nothingness, he does not address the question of what sort of nothing has this ability to affect receptivity. Receptivity must be conceived of through a type of negation, but what kind of nothing is suitable for this?

Leibniz's account of the function of the principle of nothingness is most clearly articulated in a letter to the mystic André Morell in 1698. Leibniz again states what God contributes to creatures before specifying what uniquely determines the creature's being: the creature "est variée selon les différentes combinaisons de l'unité avec le zero; ou bien du positif avec le privatif, car le privatif n'est autre chose que les limites" (Grua 126). If the privative is what limits the creature, then the privative also *forms* or determines its being by drawing its boundaries. Just as the quantity of a number is determined not only by its unity but also by its zeroes, so the creature's being is not due merely to its substantial unity but to its primary matter—without, however, this "primary matter" having any *reality* or positive being at all. This idea of the formal or forming quality of prime matter is implicit in Leibniz's statements in the *Dialogue on Human Freedom* to the effect that limitation is part of the creature's essence. In the letter to Morell, Leibniz offers a further analogy, explaining that the relation between essence and limitation parallels that between lines and points.

Leibniz conceives of limitation in this passage as a type of combination, where the terms combined are the unity and the zero. This combination cannot resemble arithmetical addition, however, since adding zero to a magnitude leaves the magnitude unchanged. Instead, he compares this combination to a geometrical procedure:

il y a partout des limites dans la creature, comme il y a partout des points dans la ligne. Cependant la creature est quelque chose de plus que les limites, car elle a receu quelque perfection ou vertu de Dieu, comme la ligne est autre chose que des points. Car dans le fonds le point (terminus lineae) n'est autre chose que la negation du progres ulterieur de ce qu'il termine. (Grua 126)

In this passage, Leibniz presents the basic form of negation operative in his theory of limitation. Negation—the principle of nothingness within all creatures—is neither contradiction nor merely the bare lack of a perfection. The point is a zero with respect to the dimension of a line: as Leibniz argues, following Aristotle, points are not even parts of lines but merely boundaries.⁶⁶ They have no magnitude and do not extend the line. Leibniz compares the perfections of a substance to a line and its imperfections to the zeroes or points that delimit it. Just as the line is something over and above the points that delimit it, so a creature has perfections that are merely bounded by its imperfections, its zero or passive force. This limiting point, however, is not something outside of the line but rather *its own* boundary. If a line is an indefinite continuum, as Leibniz argues, then it is only through its division by points, its separation by that which is nothing in relation to

⁶⁶ See Leibniz, “Nova methodus pro maximis et minimis” (1681), GM 5:220–226 and *Pacidius Philalethi* (1676), AA 6.3.529–571 at 555, translated in LLC 118–121 at 185. In this passage, Leibniz uses geometrical arguments to clarify the arithmetical, but this order of explanation does not imply that the geometrical has priority in relation to the arithmetical. Instead, Leibniz regards the logic of calculation as singular: both geometrical and arithmetical reasoning involve the same principles of combination, principles that arise from the universal procedures of logic and which he hopes to capture in his *Characteristica universalis*. For this argument, see the “Vorarbeit zur allgemeinen Charakteristik XV,” GP 7:204.

it, that it can achieve demarcation and thus definition. In order to achieve real determination, a line must be severed by that which is strictly nothing, of no dimension. This zero is not of the same nature as the line insofar as it does not possess that which is essential to a line—dimension. Precisely because the point or zero has no dimension, it is able to perform the essential function of cutting the line. Although it is incompatible with the line, it hardly arises from a principle separate from that governing the line. Leibniz's letter to Morell suggests that the relation between perfection and imperfection is to be conceived according to this mathematical model.

There lies in the essence of creatures an empty space, a zero, or point that is not a part but is nevertheless required for the activity of finite entities. Prime matter, primitive passive force, becomes itself that which marks the terminal points in the continuity of active force. The nothing is the principle of separation that delimits the continuous activity of the monad; it provides "resistance" with the force of a point bounding a line, a zero serving as the limit to an otherwise infinite series of numbers.

Chapter 3:

Kant's Theory of Intensive Magnitude in the Anticipations of Perception

In a short section of the Analytic of Principles in the *Kritik der reinen Vernunft*, Kant introduces the “principle of intensive magnitude,” which states that everything we perceive has a degree or intensity. This “principle of intensity” occupies, I will argue, a pivotal place in Kant’s system. Its importance is not apparent at first glance and does not lie in any obvious centrality to the Critical project. The principle of intensive magnitudes does not seem to contribute substantially to transcendental idealism, the refutation of Humean skepticism, the justification of synthetic a priori truths, or to any of commonly cited aims of the first *Critique*. Furthermore, most commentators have regarded the section devoted to this principle, the Anticipations of Perception, with suspicion for the obscurity and seeming imprecision of the argument.¹ The principle is nevertheless

¹ Robert Paul Wolff, Norman Kemp Smith, Paul Guyer, and Jonathan Bennett represent some typical examples of the censure the principle of intensive magnitudes has occasioned. In his *Kant's Theory of Mental Activity: A Commentary on the Transcendental Analytic of the "Critique of Pure Reason"* (Cambridge, Mass.: Harvard University Press, 1963), 232–238, Robert Paul Wolff calls Kant’s argument for the principle of intensive magnitude “one of the most artificial arguments of the *Critique*” (235) and concludes that “[q]uite clearly, the theory will not work” (236). Like Wolff, Guyer sees the principle of intensive magnitudes as founded in Kant’s theories of physics and claims that it “does not have a clear place in his transcendental theory of experience.” Guyer, *Kant and the Claims of Knowledge* (Cambridge: Cambridge University Press, 1987), 205. Bennett denies that we can have a priori knowledge that either sensation or its objects has an intensive magnitude. In *Kant's Analytic* (Cambridge: Cambridge University Press, 1966), 172, he writes: “This [that sensations have an intensive magnitude], however, merely says that our sensations *are* like that: it states an empirical fact, and has no place in Kant’s apparatus of a priori principles. He provides no arguments for the impossibility of a world in which nothing is ever dim or in-between, in which there is only one level of pain, say, and only three degrees of saturation for each color.” Kemp Smith identifies three different proofs in the Anticipations but concludes that none is satisfactory. See his *A Commentary to "Kant's Critique of Pure Reason"* (New Jersey: Humanities Press International, 1992), 349–355. For the most part, however, the section devoted to intensive magnitudes, the Anticipations of Perception, has merely been ignored or given short

decisive for the first *Critique*, because Kant brings what is given to sensibility into close proximity to what is produced by thought and is thereby confronted with the question of their exact relationship. In this sense, the Anticipations address the question left open at the end of the second version of the Introduction: whether the “zwei Stämme der menschlichen Erkenntnis ... Sinnlichkeit und Verstand” come from a common root (B29). Kant provides little theoretical elaboration upon the relationship between thought and “the given” but, instead, claims that there is one particular instance in which the spontaneity of thought extends its determinations even to the given of sensation: in the principle of intensive magnitudes.

The principle of intensive magnitudes states that we know a priori that sensation—or the “real” corresponding to it—possesses a particular degree or intensive magnitude.² This implies that we determine something about the matter corresponding to sensation: the fact that it has an intensity. According to this principle, in fact, the *only*

shrift in relation to the better-known Analogies of Experience. Henry Allison, for instance, barely mentions the section in his influential commentary, *Kant's Transcendental Idealism*, 2nd edn. (New Haven: Yale University Press, 2004). I will contest some of the specific objections raised by these commentators. More importantly, however, I will claim that the difficulties presented by the Anticipations do not stem from a furtive attempt to smuggle conclusions from Kant's physics into his theory of experience (as Guyer and Wolff claim), but instead go to the heart of a fundamental difficulty in the *Critique* itself.

² As Hermann Cohen, one of the few commentators to take the principle seriously, points out, it is unclear whether sensations, the objects of sensation, or both have intensive magnitudes. See Hermann Cohen, *Kommentar zu Immanuel Kants Kritik der reinen Vernunft*, in *Werke* (Hildesheim: G. Olms, 1989–), 4:80–85 and, for a more extensive discussion of the Anticipations, *Kants Theorie der Erfahrung*, in *Werke*, 1:538–563. In the A Edition, Kant states that both sensation *and* the reality of the object of sensation possess intensive magnitudes: “Der Grundsatz, welcher alle Wahrnehmungen, als solche, antizipiert, heißt so: In allen Erscheinungen hat die Empfindung, und das Reale, welches ihr an dem Gegenstande entspricht, (realitas phaenomenon) eine intensive Größe, d. i. einen Grad” (A 166). In the B Edition, Kant writes only that “das Reale, was ein Gegenstand der Empfindung ist, intensive Größe, d. i. einen Grad [hat]” (B 207). In sections of the proof common to the A and B editions, however, Kant still seems to hold the view that sensation itself possesses an intensity.

thing we can know a priori regarding the matter of appearances (as opposed to their forms, space and time) is that this matter has a mathematically specifiable degree located along a continuum with zero as an endpoint.³ Whereas for Leibniz intensities describe the structure of the metaphysical forces underlying changes in phenomena, for Kant, they are the determinations of what corresponds to sensation, the “matter” of appearances and not properties of things in themselves.⁴ Nevertheless, both Leibniz and Kant hold that all qualities we can experience have a particular degree. In subscribing to this principle, Kant sides with Leibniz against those who, like Descartes, argue that reality does not submit to differences in degree.⁵ But Kant deviates from Leibniz in one important regard: he makes the principle of intensive magnitudes dependent upon the conditions of sensible

³ While Kant specifies that the lower bound is zero, he does not discuss whether there is an upper bound to the degree of a quality.

⁴ Kant does invoke the distinction between intensive and extensive magnitudes in other contexts, including discussions of enlightenment, the life of species, sickness, and the strength of cognition itself. For a helpful overview of Kant’s different uses of the concept—as well as an argument that they all stem from a general theory of the intensity of the soul—see Kiril Chepurin, “Kant on the Soul’s Intensity,” *Kant Yearbook* 2 (2010): 75–94. Chepurin begins with Kant’s critical (in both senses of the term) discussion of the possibility of intensive variation in his refutation of Mendelssohn’s supposed proof of the immortality of the soul (B 413–415). While Kant’s counterargument to Mendelssohn is intriguing in discerning Kant’s own views on intensity, the refutation assumes for the sake of argument that the soul is a simple substance. Even granted that premise, Kant claims, Mendelssohn’s proof fails, because Mendelssohn does not account for the possibility of the soul’s diminishment in intensity. Since, however, Kant is concerned with denying that we know that the soul is simple, one must be wary of drawing direct consequences from Kant’s discussion of Mendelssohn in the Paralogism. While Chepurin is aware of this danger, he nevertheless thinks that a legitimate Critical use can be found for the concept of the intensity of the soul.

⁵ Kant calls Descartes’s theory the “mathematical-mechanical” account of matter in the *Metaphysische Anfangsgründe der Naturwissenschaft* at Ak. 4:533.2–3. He opposes this conception throughout the second section of the 1786 *Metaphysische Anfangsgründe*, in addition to arguing against it in the Anticipations (A173/B215–A175/B216). Eric Watkins compares Kant’s and Leibniz’s accounts of force in his “Kant on Extension and Force,” in Wolfgang Lefèvre, ed., *Between Leibniz, Newton, and Kant: Philosophy and Science in the Eighteenth Century* (Dordrecht: Kluwer, 2001), 111–127. Watkins remarks on the many similarities between Kant’s and Leibniz’s views on force, before claiming that the central difference between them lies in Kant’s rejection of the convertibility of being and unity.

cognition—and most importantly, as we will see, upon time. Devising an adequate theory of force does remain a fundamental aim for Kant in formulating the principle of intensive magnitudes, but the nature of force itself has changed.⁶ It can no longer be considered the metaphysical substratum for the world of phenomena, but instead must be seen as the product of a synthesis of what Kant calls the “real” as posited in time. Kant’s critical reappraisal of Leibnizian metaphysics means that force must be considered in relation to sensibility.⁷

⁶ In his 1756 *Physical Monadology*, Kant argues for the existence of simple substances that nevertheless fill space. This text offers his pre-Critical solution to the labyrinth of the continuum. In Kant’s own terms, it reconciles the warring claims of geometry and metaphysics, “mating horses with griffins” (Ak. 1:475). He defends the compatibility of simplicity with filling space by claiming that monads occupy space through the force of impenetrability. Since, in the pre-Critical period, Kant endorses the real causal interaction of substances, he can posit that a monad’s force consists in its exercising a force of impenetrability that determines the boundaries of its “sphere of activity.” See Thomas Holden’s discussion of what he terms the “Kant-Boscovich Force-Shell Atom Theory,” in *The Architecture of Matter* (Oxford: Oxford University Press, 2005), 236–273. As Holden notes, this theory “allows for ... material presence in space to come in a spectrum of intensity, from weakly repellant fields to stronger ones. Newton’s all-or-nothing, binary system of absolutely solid atoms and absolutely empty void-space is thus replaced with the more supple and gradualistic field-theoretic notion of *degrees* of material presence. Spaces that are occupied by matter are now full to varying degrees: materiality comes in intensive as well as extensive magnitudes” (258). Kant’s early system thus closely resembles Leibniz’s account of force; however, Kant differs from Leibniz, first, in his account of real interaction among monads; second, in his commitment to the reality of space; and, third, to the non-representational nature of the metaphysically basic monadic action. For a comparison between the pre-Critical Kant and Leibniz—as well as a valuable overview of the philosophical context for their views—see Eric Watkins, *Kant and the Metaphysics of Causality* (Cambridge: Cambridge University Press, 2005), 23–184. See also Michael Friedman’s discussion of the *Physical Monadology* in *Kant and the Exact Sciences* (Cambridge, Mass.: Harvard University Press, 1992), 7–27.

⁷ While Kant does not explicitly mention force in the Anticipations, it underlies the main application of the Anticipations, his argument for a dynamic theory of matter against a mechanical theory. He alludes to this dispute at A173/B215 when he addresses those natural scientists who hold that differences in the amount of material in two objects must be explained by attributing a greater quantity of empty space to the less dense body. If, as Kant argues, matter can have a degree, then there is an alternative explanation for differences in density. More generally, Kant supports the dynamical theory according to which forces of attraction and repulsion “occupy” space to a greater or lesser degree. Impenetrability thus submits to differences in degree and is not a simple property of bodies. Some commentators of the Anticipations—for instance Robert Paul Wolff—have argued that Kant’s real reason for introducing the principle of intensive magnitudes

This conception of intensity as the product of a synthesis of the real in time, however, is also the source of the great difficulty with the Anticipations, creating a problem that reveals a fundamental tension in the *Critique* regarding the status of the given. The principle of intensive magnitudes determines that the very matter given in sensation must have a degree. Since it is a fundamental principle of the *Critique* that we can only have a priori knowledge of that which we ourselves produce, it follows that we must determine something about the matter of sensation.⁸ But this seems to contradict Kant's insistence that we determine only the formal components of cognition. In this chapter, I will attempt to explain Kant's resolution of this problem. I will argue that matter itself has a form and that this conception of a priori determination responds to concerns that were central to Kant from the early 1760s onward.

The first section of this chapter considers Kant's criticisms of Leibniz in the Amphiboly, paying particular attention to the role of force in his account. There, Kant

was to ground his theory of dynamics; see Wolff, *Kant's Theory of Mental Activity*, 232–233. Others, including Béatrice Longuenesse, have accused these commentators of getting the order of dependence wrong: “Kant's reference to physics is indeed crucial, for it shows us *where Kant wanted to end up*: his demonstration was geared toward explaining the possibility of a mathematical physics of forces. But precisely for this reason, this physics cannot serve as a *proof* or a *ground* for the principle, even if keeping it in mind is crucial for grasping Kant's meaning.” See her *Kant and the Capacity to Judge*, trans. Charles T. Wolfe (Princeton: Princeton University Press, 1998), 319 n. 48. Daniel Warren steers a middle course in his recent book on impenetrability, arguing that the Anticipations show merely that the mechanistic picture is not the only possible one. See Warren, *Reality and Impenetrability in Kant's Philosophy of Nature* (New York: Routledge, 2001), 65–66.

⁸ Ernst Cassirer presents a particularly concise formulation of this problem: “Da aber Wahrnehmung das ‘empirische Bewußtsein’ schlechthin ist, so muß jede derartige Forderung paradox erscheinen: wie ließe sich auch etwas an demjenigen ‘antizipieren’, was uns nur—a posteriori gegeben werden kann? Die Quantität mag allgemein gültiger theoretischer Sätze fähig sein—wie aber solche über die Qualität, die uns lediglich in der Empfindung vermittelt wird, möglich sein sollen, ist vorerst in keiner Weise einzusehen.” *Kants Leben und Lehre* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1994), 191. Cassirer goes on to argue that the law of continuity—and thus the principle of intensive magnitudes—is an “allgemeiner Forderung” of our cognition of nature and thus cannot be a posteriori (192).

addresses Leibniz's arguments that all multiplicity must be grounded in unities. Kant rejects Leibniz's claim that phenomenal objects must be derived from simples, because the demand for an underlying unity applies a requirement of the understanding that does not account for the forms of sensibility. As we have seen, Leibniz's reflections on the priority of unity over multiplicity lead to his claim that monads are unities with an intensive magnitude of force; since Kant, however, does not hold that reason requires us to ground composites in simples, he is free to deny Leibniz's ontological claims regarding force. In the Amphiboly, Kant argues for a reversal of priority among several concepts, including unity and multiplicity, matter and form, and reality and negation. In the second section of the chapter, I turn to a Reflection from the 1770s in which Kant analyzes the relationship between reality and negation and explains how negation can have priority over reality for the objects of sensible experience. His discussion in the Reflection ultimately depends upon the theory of real opposition he introduces in his 1763 essay *Versuch, den Begriff der negativen Größen in die Weltweisheit einzuführen*. This essay introduces the central distinction between logical and real opposition. I will argue, however, that as a consequence of this distinction, Kant is forced to develop a theory of the orientation of realities. To address this concern, Kant introduces his account of "positing in time," a concept which underlies his theory of temporal determination in the Schematism. In the third section, I turn to Kant's discussion of the Schematism and examine his argument there for the schema of quality, before, finally, analyzing the principle of intensive magnitudes in the Anticipations of Perception. These investigations of the earlier stages of Kant's argument will reveal the conceptual foundations for Kant's discussion in the

Anticipations and show the sense in which Kant's theory of temporal determination provides a justification for the principle of intensive magnitudes.

1. Kant's Criticisms of Leibniz in the Amphiboly

In the final pages of the *Transcendental Analytic*, after presenting the positive portion of his Critical philosophy, Kant offers his famous, pithy condemnation of the rival philosophical systems of Locke and Leibniz: "Leibniz *intellektuierte* die Erscheinungen, so wie Locke die Verstandesbegriffe nach einem System der *Noogonie* ... insgesamt *sensifiziert*" (A271/B327). According to Kant, Leibniz and Locke fall prey to opposite kinds of errors, but in both cases their mistakes stem from believing that we can have cognition—which Leibniz equates with the understanding alone and Locke aligns exclusively with sensibility—of things in themselves.⁹ In both the *Amphiboly* and the note following it, Kant diagnoses the consequences of what he considers the conflation of appearances and things in themselves by examining four sets of *conceptus comparationis*, concepts that express relations that different concepts or objects can bear to one another

⁹ The merit of Kant's charge depends on the way in which one interprets the distinction between things in themselves and appearances, as well as on one's readings of Leibniz's and Locke's theories of cognition in general. While assessing the validity of Kant's polemical critique lies beyond the scope of this study, one specific reason to be skeptical of Kant's claim in the case of Locke deserves mention. In a recent article, Andrew Chignell reconstructs Kant's argument for the distinction between things in themselves and appearances as deriving from Kant's doctrine of "real repugnance." See Chignell, "Real Repugnance and Our Ignorance of Things-in-Themselves: A Lockean Problem in Kant and Hegel," *Internationales Jahrbuch des Deutschen Idealismus* 7 (2009): 135–159. Chignell interprets "real repugnance" as real—as opposed to merely logical—impossibility and locates the source of this distinction in *Locke*. If Chignell is correct, then Locke in fact provides the very distinction that leads Kant to restrict theoretical cognition to the possible objects of sensibility.

(A262/B318).¹⁰ These consist in sameness/diversity (*Einerleiheit/ Verschiedenheit*), agreement/disagreement (*Einstimmung/ Widerstreit*), inner/outer (*Inneres/ Äußeres*), and determinable/determination (*Bestimmbare/ Bestimmung*), also referred to as matter/form (A261/B317). We use these pairs of concepts to build different types of judgments, and each concept loosely corresponds to one of the four headings of judgment: quantity, quality, relation, and modality.¹¹

Kant then distinguishes between two types of comparison: mere logical reflection which abstracts from the faculty of cognition to which our representations belong and transcendental reflection, which considers the origin of these representations in our *Erkenntniskräfte* (A263/B319). Kant argues that transcendental reflection is required in order to determine the relationship among the objects we represent, because the relations

¹⁰ For a brief, sympathetic summary of Kant's criticism of Leibniz in the "Amphibolies," see H.J. Paton's "Kant on the Errors of Leibniz," in Lewis White Beck, ed., *Kant Studies Today* (La Salle, Ill.: Open Court Press, 1969), 72–87. According to Paton, the central element of Kant's arguments against Leibniz consists in Kant's charge that Leibniz confuses the concept of a thing with the thing itself. Paton derives this characterization from an analysis of Kant's distinction between logical and transcendental reflection. Paton appears to agree with Kant that if Leibniz had only recognized this distinction, he would never have claimed that we can have knowledge of things as they are in themselves. See also G.H.R. Parkinson, "Kant as a Critic of Leibniz: The Amphiboly of Concepts of Reflection," *Revue Internationale de Philosophie* 35 (1981): 302–314, and Derk Pereboom, "Kant's Amphiboly," *Archiv für Geschichte der Philosophie* 73 (1991): 50–70. For a discussion of Kant's conception of transcendental reflections, see Karin de Boer, "Pure Reason's Enlightenment: Transcendental Reflection in Kant's First Critique," *Kant Yearbook* 2 (2010): 53–74. For a more general account of the continuity of Kant's thought with the rationalist tradition, see Desmond Hogan, "Kant's Copernican Turn and the Rationalist Tradition," in Paul Guyer, ed., *The Cambridge Companion to Kant's "Critique of Pure Reason"* (Cambridge: Cambridge University Press, 2010), 21–40.

¹¹ For Kant's explanation of the different types of judgment, see §9, "Von der logischen Funktion des Verstandes in Urteilen" (A70/B95–A76/B101). In my view, the fourth pair of concepts, form/matter, does not strictly correspond to judgments of modality but is instead aligned with quality. I will return to this point later in my discussion. Béatrice Longuenesse, who provides an extensive discussion of the Amphiboly, does view the concepts of reflection as precisely aligned with the table of judgments. For her analysis of the Amphiboly, see *Kant and the Capacity to Judge*, 147–157.

between our representations depend upon the relations of these representations to the faculties of cognition (A262/B318). Kant makes two different distinctions: first, between logical and transcendental reflection, and, second, between different relations our representations can have to understanding and sensibility (whether our representations are subject to the additional constraints of sensibility or not). Logical reflection simply disregards the question of the relationship between our representations and our cognition; it treats concepts as such, without considering the way in which objects are given. Transcendental reflection, by contrast, does consider this relationship. The distinctions do not overlap exactly: if we had intellectual intuition, it would be possible to apply the concepts of comparison to objects thought through their relationship to the understanding. Since we do not have intellectual intuition, however, transcendental reflection shows us the error of considering the relationship between objects purely through the understanding. Instead, transcendental reflection reveals that we must also consider the constraints of sensibility. This distinction between logical and transcendental reflection provides the basis for Kant's diagnosis of the errors of rationalism: Leibniz and his followers do not consider the source of our representations in the faculties of cognition but instead employ merely logical concepts of comparison as though they could generate knowledge of the objects of our experience. Kant shows the implications of this error for each of the pairs of concepts, arguing that Leibniz attempts to derive metaphysical knowledge from principles that simply govern forms of thought.

One application of this critique concerns Kant's objection to Leibniz's argument that simples must underlie all composite objects.¹² Kant protests that Leibniz's thesis that composites are grounded in simples is not justified because Leibniz misapplies mere logical reflection to empirical objects. Kant's rejection of this argument in no way entails that he is committed to the claim that composite substances are *not* grounded in simples; in the Antinomies, Kant maintains that neither claim is true.¹³ For Leibniz, as we saw, the priority of unity over multiplicity motivates his theory of monads as simple substances

¹² In addition to the Amphiboly, Kant also rejects the monadological contention that composites are reducible to simple substances in the *Metaphysische Anfangsgründe* (Ak. 4:507–8).

¹³ Kant's discussion of the divisibility of composite substances in the world can be found in the second Antinomy (A434/B462–A443/B471, as well as in the solution at A523/B551–A527/B555). In the presentation of this Antinomy, Kant presents proofs that both “[e]ine jede zusammengesetzte Substanz in der Welt besteht aus einfachen Teilen, und es existieret überall nichts als das Einfache, oder das, was aus diesem zusammengesetzt ist” (A434/B462) as well as the antithetical claim that “Kein zusammengesetztes Ding in der Welt besteht aus einfachen Teilen, und es existiert überall nichts Einfaches in derselben” (A435/B463). In his resolution, Kant claims that both Thesis and Antithesis are false and that both purported proofs rest on the mistaken dialectical assumption that “wenn das Bedingte gegeben ist, so ist auch die ganze Reihe aller Bedingungen desselben gegeben” (A497/B525). Kant's argumentation is complex, but for our present purposes, it should serve as a reminder that even though Kant rejects the monadological claim, he does not thereby assert that composite substances are *not* composed of simples. Instead, he views both alternatives as relying on a hidden and false premise. For a careful recent reconstruction of the second Antinomy, see James van Cleve, *Problems from Kant* (Oxford: Oxford University Press, 1999), 62–72. Van Cleve writes that “the crux of Kant's solution to the Antinomy is thus the contention that the series whose magnitude is in dispute is a *successive* series” (70), a series, that is, for which the sequence of conditions is not given. While Van Cleve argues that Kant's analysis does not succeed, he presents it as largely plausible, concluding: “[i]n summary, Kant's idealism does not provide him with a legitimate way of avoiding the Baylean alternatives [between the claim that matter is composed of simples and the claim that it is not], but it is possible to see why he thought it did” (72). Guyer, however, claims that the argument in the second Antinomy (as well as the arguments in the other Antinomies) is circular: “they cannot imply the *joint falsehood* of dialectical opposites except by presupposing the ontological position—the identification of the world in space and time with merely indefinitely extended series of representations—for which such dialectical opposition is supposed to furnish an indirect proof.” *Kant and the Claims of Knowledge*, 410. See also Michelle Grier, *Kant's Doctrine of Transcendental Illusion* (Cambridge: Cambridge University Press, 2001), 182–214, as well as her “Transcendental Illusion and Transcendental Realism in Kant's Second Antinomy,” *Journal for the History of Philosophy* 6 (1998): 47–70.

endowed with an active force to form successive representations of the world.¹⁴ Kant discusses this argument for the priority of unity in relation to several of the concepts of comparison. I will first consider Kant's discussion of inner and outer determinations, because it connects closely to Leibniz's theory of substance as a unity of force with intensive magnitude and also because Kant explicitly presents his argument as contesting Leibniz's claim that composite substances must be grounded in simple substances. In the concluding note to the Amphiboly, Kant writes:

Drittens, die Leibnizische Monadologie hat gar keinen andern Grund, als daß dieser Philosoph den Unterschied des Inneren und Äußeren bloß im Verhältnis auf den Verstand vorstellte. Die Substanzen überhaupt müssen etwas *Inneres* haben, was also von allen äußeren Verhältnissen, folglich auch der Zusammensetzung, frei ist. Das Einfache ist also die Grundlage des Inneren der Dinge an sich selbst. Das Innere aber ihres Zustandes kann auch nicht in Ort, Gestalt, Berührung oder Bewegung, (welche Bestimmungen alle äußere Verhältnisse sind,) bestehen, und wir können daher den Substanzen keinen andern innern Zustand, als denjenigen, wodurch wir unsern Sinn selbst innerlich bestimmen, nämlich den *Zustand der Vorstellungen*, beilegen. So wurden denn die Monaden fertig, welche den Grundstoff des ganzen Universum ausmachen sollen, deren tätige Kraft aber nur in Vorstellungen besteht, wodurch sie eigentlich bloß in sich selbst wirksam sind. (A274/B330).

In this condensed paragraph, Kant describes two stages in Leibniz's argument: first, Leibniz establishes that composite substances must be grounded in simple substances and then argues that their internal determinations must be representations. The first argument starts from the premise that all external relations must be grounded in internal determinations. Composition, however, is an external relation. The relation of composition can be grounded in internal determinations only if composite substances are grounded in simple substances. Therefore, composite substances are grounded in simple

¹⁴ For Kant's argument against the "rationale Seelenlehre"—which claims that the soul is an immaterial, immortal simple substance—see the Paralogisms, A341/B399–A404/B431.

substances. In the second part, Kant reconstructs Leibniz's motivation for claiming that the simple substances are monads whose active force consists in representations. Since representations are the only internal determinations with which we are acquainted, Leibniz argues that representations constitute the inner determinations of simple substances.¹⁵

Kant objects to the initial premise of the first argument: when we engage in transcendental reflection, we are not permitted to claim that external relations must be grounded in internal determinations. In particular, this principle does not hold for objects given in sensibility. In his discussion of the equivocation between the logical and the transcendental concepts of external relations and internal determinations, Kant explains why Leibniz's principle does not obtain for the objects of sensibility: "An einem Gegenstande des reinen Verstandes ist nur dasjenige innerlich, welches gar keine Beziehung (dem Dasein nach) auf irgend etwas von ihm Verschiedenes hat. Dagegen sind die innern Bestimmungen einer substantia phaenomena im Raume nichts als Verhältnisse, und sie selbst ganz und gar ein Inbegriff von lauter Relationen" (A265/B321).¹⁶ As he

¹⁵ Kant considers the premise for this analogy to be flawed. Although our representations are "inner"—that is, they are not in space—they nevertheless are structured by time, a form of intuition. Thus, even our inner states, for Kant, are not outside of the conditions of sensibility but are only appearances and are themselves relational: "Nicht allein, daß darin die Vorstellungen *äußerer Sinne* den eigentlichen Stoff ausmachen, womit wir unser Gemüt besetzen, sondern die Zeit, in die wir diese Vorstellungen setzen, die selbst dem Bewußtsein derselben in der Erfahrung vorhergeht, und als formale Bedingung der Art, wie wir sie im Gemüte setzen, zum Grunde liegt, enthält schon Verhältnisse des Nacheinander, des Zugleichseins, und dessen, was mit dem Nachsein zugleich ist (des Beharrlichen)" (B67–68).

¹⁶ In his *Reality and Impenetrability in Kant's Philosophy of Nature*, 36–58, Daniel Warren analyzes Kant's criticism of the rationalists' thesis that inner determinations are more fundamental than relations, arguing that Kant's distinction between merely comparative and absolute inner properties provides a lens through which we can grasp Kant's theory of the thing in itself. Warren takes as fundamental Kant's point in this passage that the only properties of phenomenal substances we can cognize are those that produce effects in space. See also Watkins's discussion of

makes clear in the following lines, these relations are always among different phenomenal substances and thus do not satisfy the criterion for internal determination of objects of the understanding. Kant's claim in this passage that the internal determinations of phenomenal substances contain nothing but relations rests on the exposition of space in the Transcendental Aesthetic. Specifically, he reiterates a point he had already made in the general remarks upon the Transcendental Aesthetic: everything that is presented in intuition contains only relations (B66–67). In the Aesthetic, Kant argues from this to the conclusion that we can only have cognitions of appearances and not things in themselves, since we would need to have cognition of non-relational properties to have positive knowledge of things in themselves: “Nun wird durch bloße Verhältnisse doch nicht eine Sache an sich erkannt: also ist wohl zu urteilen, daß da uns durch den äußeren Sinn nichts als bloße Verhältnisvorstellungen gegeben werden, dieser auch nur das Verhältnis eines Gegenstandes auf das Subjekt in seiner Vorstellung enthalten könne, und nicht das Innere, was dem Objekte an sich zukommt” (B67). Kant describes two different types of irreducibly external relational properties possessed by phenomena: first, as given through outer sense, their spatial properties are ineliminable, and, second, because they are representations, they have a necessary relation to a subject of representations.

Kant's point is not merely that spatial properties are all relational, for Leibniz would certainly agree with this assertion and would argue that the relationality of spatial determinations means that they are not metaphysically fundamental but rely upon more basic properties. Instead, Kant maintains that the sort of objects that can be given through

the relation between simples and composites in noumena and phenomena in “Kant on Extension and Force,” in which he observes that “[i]n other words, phenomenal composition is diametrically opposed in this regard to noumenal composition” (116).

outer sense, objects with spatial properties, cannot be cognized as having additional, non-externally relational properties. He argues for this based upon the type of representations that can be given through the outer sense: the “Eigenschaft” of our mind by which we posit objects as outside ourselves and in space (A22/B37). Whatever is presented by outer sense can only have properties of the same type—external relational properties—as those which characterize the outer sense itself and cannot “contain” purely inner properties capable of grounding their spatial relations. Since Leibniz’s reductionist account depends upon such fundamental internal properties underlying spatial relations, Kant undercuts Leibniz’s thesis.¹⁷ Kant’s account depends, therefore, on his exposition of space in the *Transcendental Aesthetic*.

In the *Aesthetic*, Kant argues that space is a pure intuition and not a general concept of relations (A25/B39). This thesis implies not only that external spatial relations cannot be derived from conceptual determinations, but that the relationship between parts and wholes within space differs from the relationship Leibniz proposes. Leibniz famously claims that space is nothing over and above the collection of all spatial relations. In the third point of §2, the “*Metaphysische Erörterung*” of space, Kant contests this by arguing that space is not composed of these relations, but must instead exist as a whole before any of its parts. This implies, for Kant, that space is an intuition rather than a

¹⁷ “Die Materie ist substantia phaenomenon. Was ihr innerlich zukomme, suche ich in allen Teilen des Raumes, den sie einnimmt, und in allen Wirkungen, die sie ausübt, und die freilich nur immer Erscheinungen äußerer Sinne sein können. Ich habe also zwar nichts Schlechthin-, sondern lauter Komparativ-Innerliches, das selber wiederum aus äußeren Verhältnissen besteht. Allein, das schlechthin, dem reinen Verstande nach, Innerliche der Materie ist auch eine bloße Grille; denn diese ist überall kein Gegenstand für den reinen Verstand, das transzendente Objekt aber, welches der Grund dieser Erscheinung sein mag, die wir Materie nennen, ist ein bloßes Etwas, wovon wir nicht einmal verstehen würden, was es sei, wenn es uns auch jemand sehen könnte” (A277/B333).

concept, because intuitions are given as wholes of which their parts are limitations, rather than compositions based on parts:

Denn erstlich kann man sich nur einen einigen Raum vorstellen, und wenn man von vielen Räumen redet, so verstehtet man darunter nur Teile eines und desselben alleinigen Raumes. Diese Teile können auch nicht vor dem einigen allbefassenden Raume gleichsam als dessen Bestandteile (daraus eine Zusammensetzung möglich sei) vorhergehen, sondern nur *in ihm* gedacht werden. Er ist wesentlich enig, das Mannigfaltige in ihm, mithin auch der allgemeine Begriff von Räumen überhaupt, beruht lediglich auf Einschränkungen. Hieraus folgt, daß in Ansehung seiner eine Anschauung a priori (die nicht empirisch ist) allen Begriffen von *demselben* zum Grunde liegt. (A25/B39).

From this condensed exposition of the singularity and totality of space, Kant concludes that space must be an a priori intuition rather than a concept.¹⁸ Since space is itself the form through which any object can be given in outer intuition, the structural features Kant describes also condition our representations of objects. But, as he makes clear in this passage, the kind of relation between the unity of space and the plurality of spatial relations stands in stark contrast to the relationalist model of parts and wholes he is attacking.¹⁹ Instead of a whole composed of parts, space is originally given as a totality capable of limitation. Kant emphasizes the original unity of space, but it is a unity containing infinite potential divisions (B40). The whole of space is prior to its parts, and, although unity precedes multiplicity, it is the unity of a continuum rather than of a simple. Continuous unity is thus the distinguishing feature of intuitions, as opposed to

¹⁸ In points one and two of the “Metaphysical Exposition” of space, Kant shows that space is an a priori representation (A23/B38). In points three and four, he then argues that it must be an intuition and not a concept (A24–25/B39). Kant’s theory of concepts as rules for categorizing individual objects underlies his claim that space is an intuition. Concepts unify particulars *under* them, rather than containing the manifold *within* them. Intuitions, on the other hand, are presented as immediately given totalities.

¹⁹ As is commonly known, Kant’s claim is directed against Leibniz’s relationalism, for which Leibniz argued in his correspondence with Samuel Clarke. For Clarke’s account, see GP 7:364. For Kant’s, see A275/B331–32.

concepts. Leibniz, on the other hand, does not distinguish between intuitions and concepts. Instead, he argues that the continuity constitutive of spatial relations implies that these relations must be merely ideal. In both the passages from the Aesthetic and the discussion of inner and outer determinations in the Amphiboly, Kant attempts to show that the very features that Leibniz believed consigned space to ideality are constitutive of sensibility. Furthermore, since we can only have cognition of what can be presented in sensibility, the unity of a continuum conditions the presentation of objects. Thus, for Kant, the part/whole relation Leibniz takes as fundamental does not apply to the objects of sensibility.

Without the principle that all composite substances must be grounded in simple substances, the motivation for Leibniz's ontology is lost. This, in turn, means that the activity of substances no longer needs to be explained as an internal force with a determinate magnitude that itself is metaphysically prior to the extended properties it grounds. The problem of reconciling a geometrical view of the infinite divisibility of extension and the metaphysical claim for the priority of the simple over the complex is thus removed—once we properly account for sensibility, we see that we have merely misapplied a concept of the understanding, taking it for a principle by which we can achieve cognition of things in themselves.²⁰ As we saw in the discussion of space in the Transcendental Aesthetic, the properties of the continua that are purely ideal for Leibniz become constitutive features of objects as appearances. But transforming the merely ideal into a structuring principle creates a new problem: how can the concepts of

²⁰ For an informative account of the development of Kant's views concerning the correct resolution of the tension between the geometrical thesis of infinite divisibility and the metaphysical argument for simples, see Friedman, *Kant and the Exact Sciences*, 1–52.

understanding be applied to the objects given in sensibility, when its structuring principle seems to violate the requirements of the understanding? This problem arises because Kant can no longer say that the defining characteristics of sensibility confer a degree of falsity upon it. Leibniz's solution rests on distinguishing degrees of reality, while Kant must reconcile the irreducible conditions of an object's givenness with the demands of the understanding. In claiming that transcendental reflection shows that internal determinations do not precede external relations for objects given in sensibility, Kant faces a conflict between the way in which an object is given and a requirement of the understanding. Confronted with objects whose external relations cannot be derived from internal determinations, we are left with the question of how it is possible to conceive of a relation not reducible to intrinsic properties of its relata—or, indeed, intrinsic properties of any substances whatsoever. For Kant, this is not strictly speaking a conflict between the structure of sensibility and the structure of the understanding, because he argues that sensibility provides the very conditions for the application of the categories of the understanding. Sensibility is required for discursive subjects to have cognition of objects at all; there cannot be a mere object of the understanding and thus no object whose internal determinations ground its external determinations. Nevertheless, it seems that Kant needs to explain how the concepts of comparison can be applied to objects of sensibility so that cognition can occur. In other words, if we cannot employ these concepts to cognize the objects of sensibility—and if we have no access to other objects—then what use are these concepts at all? If there is no way to experience the priority of internal determinations and thus if this priority can deliver no cognition, then how can the concepts of comparison

help us grasp our experience? Kant addresses the question of mediation between sensibility and the understanding in several places—including the Schematism, which will be considered later—but, at this juncture in the *Amphiboly*, he instead illustrates this problem through a discussion of different types of forces.

Kant contrasts the forces phenomenal substances possess with the internal determinations and forces that would apply to an object of the understanding, were such an object to be cognizable. After claiming that the “internal determinations” of phenomenal substances are “nichts als Verhältnisse,” Kant characterizes these relations as consisting in the forces of attraction and repulsion:

Die Substanz im Raume kennen wir nur durch Kräfte, die in demselben wirksam sind, entweder andere dahin zu treiben (Anziehung), oder vom Eindringen in ihn abzuhalten (Zurückstoßung und Undurchdringlichkeit); andere Eigenschaften kennen wir nicht, die den Begriff von der Substanz, die im Raum erscheint, und die wir Materie nennen, ausmachen. Als Objekt des reinen Verstandes muß jede Substanz dagegen innere Bestimmungen und Kräfte haben, die auf die innere Realität gehen. (A265–66/B321)

We can have cognition of phenomenal substances only because they possess forces that act on other substances. Unlike Leibnizian forces, which are only internally causally efficacious, these Kantian phenomenal forces act to affect the spatial relations among several substances.²¹ Since phenomenal substances are characterized as such by their

²¹ Kant’s formulation here seems to imply an explanatory regress, for how can we recognize the effects of a force upon a substance unless we have some cognition of that substance itself? But, of course, any cognition of that substance must, in turn, consist merely in its effect upon yet another substance. In the *Metaphysische Anfangsgründe der Naturwissenschaft*, Kant provides a much more thorough account of the fundamental place of force in his theory of phenomenal substance. See, in particular, the second chapter on Dynamics. The second charge Kant might face here would be the accusation of vacuity: if we define forces in terms of their effects, then we cannot expect our introduction of forces to *explain* their effects in any way. For an account of this difficulty, see Watkins, “Kant on Extension and Force.” He points out that from *Thoughts on the True Estimation of Living Forces* on, Kant saw the problem of vacuity as one horn of a dilemma, the

external spatial relations, Kant posits the forces of attraction and repulsion as the underlying causes of changes in these relations. This explains why attraction and repulsion are ultimately the only properties that we can attribute to substances within space: the concept of force simply designates the principle that determines which spatial relations obtain for phenomenal substances. This relationship shows why Kant moves directly from his claim regarding inner and outer relations to his discussion of force: forces are not just one type of property phenomenal substances may have but are the properties that account for the laws that determine the spatial relations of these substances. This close connection between force and the structuring conditions of sensibility raises the question whether Kant is attempting to deduce substantive theses of dynamics on the basis of transcendental philosophy alone, a derivation which would exceed the stated purview of critical reflection.²² Since, however, Kant neither attempts to describe the nature of these forces nor to specify the laws that govern the interaction of substances in space, his claim can simply be interpreted as the transcendently justified assertion that phenomenal substances are governed by law-like relations. The concept of force in this account is merely that of a relational property possessed by an object such that precisely those external relations hold between it and other forces as are prescribed by whatever laws in fact govern material interactions.

other horn constituted by Leibniz's explanation of forces as primitive activity. Watkins suggests that Kant can solve the problem of vacuity: "By appealing to Leibniz' core notion of force Kant can thus attribute a content to force that goes beyond its empirical effects" (124) but without the obscurity of Leibniz's metaphysics.

²² This might be taken to substantiate Robert Paul Wolff's charge that the Anticipations themselves are merely an excuse for Kant to justify dynamics by transcendental means.

As emerged in Kant's discussion of internal and external relations, transcendental reflection reveals why Leibniz goes astray despite applying seemingly unimpeachable metaphysical principles. With respect to each of the four pairs of concepts of comparison, Leibniz makes a structurally analogous mistake by discounting the manner in which objects are given in sensibility. For an informative account of Leibniz's error, according to Kant, we must determine the specific feature of the conditions of sensibility that prevent Leibniz's inference from going through. The structural traits of sensibility that change the application of the concepts of reflection emerge most clearly in Kant's discussion of matter and form. As Kant states in the Transcendental Aesthetic, appearances are constituted by matter and form: "In der Erscheinung nenne ich das, was der Empfindung korrespondiert, die *Materie* derselben, dasjenige aber, welches macht, daß das Mannigfaltige der Erscheinung in gewissen Verhältnissen geordnet *werden kann*, nenne ich die *Form* der Erscheinung" (A20/B34). This delineation of the two aspects of the appearance, in which matter corresponds to sensation and form allows the manifold of appearance to be ordered, provides the basis for Kant's account of space and time as a priori forms of intuition in the Transcendental Aesthetic. Since, for Kant, matter and form compose appearances, examining the difference between their relationship in appearance and their role in purely logical reflection shows the structure of sensibility particularly directly: form, which makes it possible to order the manifold of appearances, precedes that which it organizes.

In the Amphiboly, Kant provides a definition of the concepts of matter and form considered only through general logic in isolation from the faculties of cognition: "Der

erstere [the concept of matter] bedeutet das Bestimmbare überhaupt, der zweite [the concept of form] dessen Bestimmung” (A266/B322). First, Kant explains how the logician applies the concepts of matter and form to elements within judgment and then how Leibniz and his followers purport to extend these concepts to objects:

Auch wurde in Ansehung der Dinge überhaupt unbegrenzte Realität als die Materie aller Möglichkeit, Einschränkung derselben aber (Negation) als diejenige Form angesehen, wodurch sich ein Ding vom andern nach transzendentalen Begriffen unterscheidet. Der Verstand nämlich verlangt zuerst, daß etwas gegeben sei, (wenigstens im Begriffe,) um es auf gewisse Art bestimmen zu können. Daher geht im Begriffe des reinen Verstandes die Materie der Form vor, und Leibniz nahm um deswillen zuerst Dinge an (Monaden) und innerlich eine Vorstellungskraft derselben, um darnach das äußere Verhältniß derselben und die Gemeinschaft ihrer Zustände (nämlich der Vorstellungen) darauf zu gründen. (A267/B323).

In Kant’s reconstruction, Leibniz equates unlimited reality with the “matter of all possibility” and regards this matter as ontologically primary, while he identifies form with the negation and limitation that he construes as ontologically secondary. Kant seems to accuse Leibniz of holding the exact opposite position from what Leibniz espouses, since Leibniz argues that the reality of substances is entirely due to the “substantial form” that constitutes their active force.²³ Prime matter, on the other hand, is a passive force that limits the reality of substances by restricting their activity.²⁴ Why, then, does Kant take these terms in such an un-Leibnizian sense? Although Kant does not cite the sources for

²³ In other contexts, however, Kant accurately reconstructs Leibniz’s, Wolff’s, and Baumgarten’s concept of reality as positive determination, rather than as determinable matter. For instance, in the Transcendental Ideal, as well as in numerous Reflections from the 1770s, Kant presents the rationalists’ argument that the principle of complete determination, according to which every thing must possess one of each pair of opposing determinations, presupposes a being with the maximal degree of all realities—an *ens realissimum* grounding the space of all possibilities (A605/B633–A606/B634). “Realities” are precisely the *determinations*, not their determinable material.

²⁴ For a discussion of Leibniz’s concepts of form and matter, see the final section of the previous chapter.

his claim, his argument seems to apply Aristotle's definition of matter and form—the determinable and determination respectively—to possible and actual objects.²⁵ Even if Kant is using a different concept of form and matter from Leibniz, however, the latter nevertheless maintains that reality must precede negation. Leibniz does not, however, conceive of reality as the determinable and negation as a limitation that would determine this reality. Reality is instead the active force that constitutes the substance's internal determinations, which in turn provide the basis for the external relations among substances. Reality thus grounds the positive properties possessed by a substance, while negation consists in the lack of a property.

For Kant, however, form and matter *do* stand in a relationship of determinable and determined. But matter is the determinable, while form is the determination: the forms of intuition determine the possibility of that which is given, of the matter of appearances. The “subjektive Beschaffenheit der Sinnlichkeit,” comprising the forms of intuition, precedes and conditions the possibility of the matter of appearances.²⁶ This is Kant's central claim in the Transcendental Aesthetic, but it is noteworthy in the present context, because it may forestall a misunderstanding arising from Kant's initial definition of the form and matter of appearances. From his definition at A20/B34, it might seem as though form and matter were two independent components of appearance, where the matter would be the part of the appearance that is purely given, while the form would be the

²⁵ Aristotle, *Metaphysics* Z, 1; Aquinas, *De ente et essentia* 2; *Summa theologiae* Ia, q. 50, a. 3, ad 3.

²⁶ For an extensive discussion of the priority of form over matter, see Talesjo Nakazawa, *Kants Begriff der Sinnlichkeit: Seine Unterscheidung zwischen apriorischen und aposteriorischen Elementen der sinnlichen Erkenntnis und deren lateinische Vorlagen* (Trier: Frommann-Holzboog, 2009), 152–169. See Nakazawa more generally for a careful *Begriffsgeschichte* of *Sinnlichkeit* and its relation to *sensualitas* in Kant's work.

part contributed by the mind. Kant's insistence that form conditions the possibility of matter shows why form and matter are not distinct parts of appearances. To condition the possibility of matter—to precede it—is not to alter or organize something that would be separable from its form even in principle: it is not to cast a stamp upon the given. Rather, the given can only exist when it is subject to the conditions of sensibility—when it is formed.²⁷ Consequently, Kant maintains that the logical priority of reality over negation is reversed for the objects of sensibility. Why does sensibility cause reality and negation to switch priority? How does the way in which an object is given affect whether matter or form serves as its ground of possibility? To approach Kant's reasons for holding that sensibility changes the relation of reality and negation, it is helpful to examine the development of Kant's views in the 1760s and 1770s, for these texts reveal that Kant's Critical doctrine of the relation of the reality/negation distinction to sensibility incorporates a number of different arguments regarding logic, metaphysics, and sensibility. By finding the precise context in which Kant introduces the connection between reality/negation and sensibility, we can see what he intends this link to accomplish.

²⁷ According to this reading, Kant contests what would later be termed the “myth of the given,” first identified and critiqued as such by Wilfrid Sellars. As Sellars notes in “Empiricism and the Philosophy of Mind,” in his *Science, Perception and Reality* (London: Routledge & Kegan Paul, 1963), 127–196, the contents of our sensations are not brute givens but are responsive to our cognitive projects. Many commentators, including Longuenesse, have worried, however, that any reading that would dispense with a brute given turns Kant's transcendental idealism into a “Fichtean and Hegelian idealism” (*Kant and the Capacity to Judge*, 300). For this reason, Longuenesse distinguishes between the “affection of the representational capacities by a thing in itself,” which would be ‘strictly *given*, in no way a product of synthesis” from the matter of appearances, which would already be constituted by synthesis. In accordance with this, Longuenesse interprets the “matter” of A20/B34 as “transcendental matter,” the subject's affection by a thing in itself (300).

2. Negative and Intensive Magnitudes in the Pre-Critical Writings

In a Reflection from the early 1770s in which he comments upon Alexander Baumgarten's *Metaphysics*, Kant remarks that rationalists such as Baumgarten are wrong to assert that reality is more fundamental than negation: on the contrary, for sensible objects, Kant claims that realities are grounded in negations.²⁸ Kant's contention overturns a line of thought whose origins stretch at least to Aquinas, according to which realities—true determinations—are metaphysically prior to their negations and all finite realities have their source in a single being possessing the highest degree of all realities.²⁹ The rationalists' argument for this position depends upon the Principle of Complete Determination. This principle states that for each possible property, P , for every object, x , either x is P or x is *non- P* . They attempt to derive the conclusion that a being with the greatest degree of all reality (an *ens realissimum*) exists from what they claim are purely logical premises—the Principle of Complete Determination, the priority of reality over negation, and the compossibility of all realities.³⁰ As is well-known, in the *Critique of Pure Reason*, Kant argues that logic alone cannot provide theoretical cognition of the existence

²⁸ Refl. 5270, Ak. 18:138–139.

²⁹ For Baumgarten's statement of the principle, see *Metaphysica*, §148, reprinted in Ak. 18:56–57. For Aquinas, see *De ente et essentia*, 1.

³⁰ It is a matter of contention whether the Principle of Complete Determination (PCD) is a merely logical principle that can be derived from the Law of the Excluded Middle (LEM), which states that for any proposition, q , either q or *not- q* . In the first *Critique*, Kant denies that PCD is equivalent to LEM. For a defense of Kant's position, see Nicholas Stang, "Indeterminacy and Transcendental Idealism" (manuscript). Stang shows that Kant denies the analyticity of PCD because of his doctrine of infinite judgment. Kant claims there is a distinction of scope between x is-not P (where the negation pertains to the copula) and x is *non- P* in the Table of Judgments (A70/B95–A73/B98). This distinction between negative and infinite judgments allows him to claim that there is a gap between the analytic LEM and the PCD. I discuss infinite judgment at greater length in the next chapter. The question of whether the PCD is analytic will not be relevant to my analysis here, however, because Kant does not question this part of the rationalists' argument in Refl. 5270 but instead focuses on the priority question.

of such a being; however, his thesis that negations are more metaphysically fundamental than realities for the objects of sensibility has received far less attention.³¹ This reversal appears radically counterintuitive on its face, and it is difficult even to make sense of the claim: what does it mean to say that not possessing a property is metaphysically more fundamental than possessing it? How can realities be “grounded in” negations? And why should this reversal of priority arise from the introduction of sensibility as a distinctive mode of cognition? I consider these questions in §2.1.

The answers to these questions and the reason for Kant’s surprising metaphysical about-face are to be found, I will argue, in his 1763 essay on negative magnitudes, in which Kant introduces the distinction between logical and real opposition.³² This distinction is the source of Kant’s much-maligned theory of intensive magnitudes—his claim in the *Anticipations of Perception* that it is an a priori principle of the understanding that the reality corresponding to sensation has a degree, i.e. an intensive magnitude. I will argue, first, that far from being extraneous to Kant’s primary philosophical commitments, his concept of intensity is introduced in order to describe the new form of real opposition, which requires that realities possess not only different degrees but be capable of being both “positive” and “negative” and thus of canceling one another out (§2.2); second, that examining Kant’s account of real opposition in relation to his distinction between relative and absolute positing reveals that Kant is implicitly committed to a third kind of positing—what I will call an “intensive” or real positing (§2.3); and, third, that it is this theory of real positing which explains Kant’s reversal of

³¹ Kant’s argument against the rationalists is found in the *Transcendental Ideal*, A571/B599–A572/B600.

³² Ak. 2:167–204.

dependence between reality and negation. Finally, in my concluding remarks, I will briefly consider several implications of Kant's concept of intensive magnitude (§2.4). Kant claims that two features are essential to intensive magnitudes: that the whole has priority over the part and that they possess a different kind of "limit" from extensive magnitudes. While the first feature of intensive magnitudes is frequently taken as the sole criterion, I will discuss some implications of Kant's second definition and re-connect it to his focus on concepts of the limit in the Critical system.

2.1 Reflection 5270 and the priority of negation

Kant considers Baumgarten's argument for the existence of an *ens realissimum* on the basis of the principle of complete determination in a series of reflections from the early 1770s annotating passages from Baumgarten's *Metaphysica*. Kant's fullest treatment of this principle is found in Reflection 5270, the first two paragraphs of which read:

Das princip der durchgängigen Bestimmung: *qvodlibet existens est omnimode determinatum, i.e. ens qvodlibet per se non nisi ut omnimode determinatum dari potest, sed per conceptum de ipso multimode potest esse indeterminatum.*³³

Jener Satz hat den Inbegrif aller moglichen Prädikate mit ihren *oppositis* und, da zu dem Daseyn blos realitaet gehort, den Inbegrif aller Realitaeten mit ihren *oppositis* in Gedanken; und, da ein jedes Ding, was nicht alle realitaet enthält, immer ein Anderes voraussetzt, das sie enthält: so hat er auch den Begriff eines Dinges, was alle realitaet enhalt, als *entis logice orginari* vor Augen, dessen realitaet oder die folgen derselben durch limitation alle Dinge geben und in Beziehung worauf ein jedes Ding zum unterschiede von anderen allein bestimmt werden kan. (Refl. 5270; Ak. 18:138)³⁴

³³ "Everything that exists is determinate in all regards, i.e. an entity in itself cannot be given except as determinate in all regards but the concept of it can be indeterminate in many regards." Immanuel Kant, *Notes and Fragments*, trans. Paul Guyer (Cambridge: Cambridge University Press, 2005), 224 fn. b.

³⁴ See also Refl. 5269, Ak. 18:138; Refl. 5271–5274, Ak. 18:139–140. For an insightful analysis of the development of Kant's arguments concerning the concept of reality, as well as an analysis of these Reflections in the context of the Transcendental Ideal, see Anneliese Maier,

Kant's formulation of the principle of complete determination in the first sentence refers to Baumgarten's definitions of determination, reality, and negation. In §34, Baumgarten notes that something is "determined" with respect to a possible predicate, *A*, if either *A* or *non-A* applies to it. If neither applies, then the object may be said to be "indeterminate" with respect to that predicate.³⁵ Determinations can be either positive or negative: if *A* applies to the object, then the determination will be positive, if *non-A* then it is negative. Baumgarten allows, however, that the forms of predication of judgment may mask the actual possession or non-possession of properties within an object. In order to distinguish between true and false determinations, he introduces the terms "reality" and "negation." A true, positive determination is a "reality," while a true, negative determination is a "negation" (*Metaphysica*, §36). Therefore, negation is always the *lack* of a real property. On the other hand, "Negatio apparens est *realitas cryptica*, *realitas* apparens est *vanitas*", "a [merely] apparent negation is a hidden reality, [whereas] an apparent reality is a vanity."³⁶ Baumgarten formulates the Principle of Complete Determination in the context of this series of definitions: for all things, one of every pair of possible

Kants Qualitätskategorien, *Kant-Studien Beiheft* 65 (1930): 40ff. Longuenesse also discusses the priority of negation over reality in Refl. 5270 in *Kant and the Capacity to Judge*, 309–310.

³⁵ "Quod aut ponitur esse *A*, aut ponitur esse *non A*, *determinatur*. Quod vero tantum ponitur esse aut *A*, aut *non A*, est *indeterminatum*. Seu, si de subiecto respectu praedicatorum contradictionum nil ponitur, nisi alterutrum ex illis ipsi convenire, subiectum illud respectu horum praedicatorum est *indeterminatum*; *determinatur* autem, si alterutrum in subiecto ponitur. Quod determinari potest, est *determinabile*. De quo ergo aut poni potest, illud esse *A*, illud esse *non A*, illud est *determinabile*." Baumgarten, *Metaphysica*, §34, Ak 17:33–34.

³⁶ "A [merely] apparent negation is a hidden reality, [whereas] an apparent reality is a vanity." [Trans. CED] "Quae determinatio ponitur in aliquo (notae et praedicata), sunt *determinationes*, altera positiva, et affirmativa... quae si vere sit, est *realitas*, altera negativa ... quae si vere sit, est *negatio*. Negatio apparens est *realitas cryptica*, *realitas* apparens est *vanitas*." Baumgarten, *Metaphysica*, §36, Ak. 17:34.

properties, *A* and *non-A*, applies to that thing, whereas concepts can be indeterminate with respect to possible properties.

Kant reconstructs Baumgarten's argument for the necessity of the concept of a being containing the greatest degree of all realities on the basis of the principle of complete determination, even defining the *principium omnimodae determinationis* in terms of the concept of the *ens realissimum* in the subsequent Reflection: "Das *principium omnimodae determinationis* ist: Ein jedes Ding steht in Ansehung seiner ganzen Möglichkeit unter dem Begriffe des *entis realissimi*" (Refl. 5271, Ak. 18:139). He argues that this principle is a law of the understanding and that it presupposes the concept of a thing that contains all reality. Since, for Baumgarten, a reality is a true, positive determination, the principle of complete determination entails that every object will have either a given reality or its opposite. In Kant's presentation, Baumgarten's argument relies on two additional premises: first, there is a positive property that is the conjunction of all positive properties and possibly something can possess it; second, if something possesses the negation of any possible property, then there must be some other object that has that property. It is this second premise that implies that realities are metaphysically more fundamental than negations. In other words, the claim for the fundamentality of realities depends for its justification on the thesis that an object's possessing *non-P* entails that there must be some conceptually possible object that possesses *P* if *P* is a reality. Since the conjunction of all realities is itself a possible property—there is no logical incompatibility among realities—we have the concept of a being that possesses all realities. The concept of any finite thing's reality would then be derived from a conceptual "limitation" (*Einschränkung*) of

the *ens realissimum*. This argument restricts the rationalist proof of the existence of such a being to a proof of the mere concept of such a being. With respect to conceptual determinations, Kant accepts the priority of reality over negation, though, as he will make clear in the following paragraph, he does not think that the existence of such a being follows from its concept.³⁷

In the second paragraph of this Reflection, however, Kant contrasts the relations of reality and negation in the two cases of concepts and sensibility:

Wenn ich mir den Verstand, der die Realität denkt, als Licht und, so fern er sie aufhebt, als Dunkelheit vorstelle: so kan man sich die durchgangige Bestimmung entweder als ein hinein tragen des Lichts hin und wieder in die Finsternis denken oder die Finsternis als bloße Einschränkung des allgemeinen Lichts, und so unterscheiden sich die Dinge nur blos durch die Schatten, die realitaet liegt zum Grunde und zwar nur eine einzige allgemeine. Im entgegengesetzte Falle unterscheiden sich die Dinge nur bloß durch ihr Licht, als ob sie ursprünglich aus der Finsternis gehoben wären. Ich kan mir aber wohl eine negation denken, wenn ich realitaet habe, aber nicht, wenn keine realitaet gegeben ist. Also ist die realität logice das erstere, und daraus wird geschlossen, daß es auch metaphysice und objectiv das erste sei. ... Weil Gegenstade der Sinne durch den Verstand nicht (und überhaupt nicht a priori) gegeben sind, so ist hier die negation das erste und die Finsternis, aus der das Licht der Erfahrung Gestalten ausarbeitet. Also Erscheinungen gemäß ist sind Manigfaltige Ursprünglich, und die Einheit entspringt, wenn man von der Manigfaltigkeit abstrahiert. (Refl. 5270, Ak. 18:139)

The passage relies upon a tradition, dating from Aristotle, of interpreting light as a positive, real characteristic and darkness as its privation.³⁸ From scholasticism onward, the state of illumination provides an example of a reality—a true, positive determination of an

³⁷ See also Refl. 5269: “Daß *ens realissimum* logisch möglich sei, ist kein Zweifel; ob es realiter möglich sei, 1. so daß alle realitat in ihm als subject, 2. oder durch ihm als Grund, oder 3. von ihm als Theil eines Ganzen existire? Davon laßt sich nur erkennen, daß das Letzere nicht *ens realissimum* sein könne” (Ak. 18:138). The concept of the *ens realissimum* rules out the hypothesis that reality could be a part of a whole, because containing parts is incompatible with possessing the greatest degree of reality, i.e. perfection. But the logical possibility of the *ens realissimum* does not further determine its metaphysical possibility.

³⁸ Aristotle, *De Anima*, II 7, 418b13.

object.³⁹ Kant invokes this imagery, but he reconfigures the terms of the analogy by comparing the *understanding* to both light and darkness: it is like light when it cognizes a reality, while it is akin to darkness when it removes (*aufhebt*) this reality. By the end of the passage, however, Kant has altered the terms of the metaphor: it is no longer the understanding that can illuminate the realities of the object but rather experience. Two points need to be made about Kant's use of this figure. First, by referring to the faculty of cognition as the source of illumination, he implies that the determinations of objects are at least partially dependent on their relations to cognition. Second, within this new framework, the transition in the text from conceiving of the understanding as the power of illumination to considering experience the source for our cognition of objects allows Kant to focus on the conditions for an object to be given to us. For all its apparent generality, the structure delineated in the first part of the passage—according to which reality is logically anterior to negation—cannot apply to the objects of the senses. Since the understanding cannot see such objects until these objects are given to it by experience, the understanding is confronted with an originary darkness broken only by light from another source. Until these objects are given to it by experience, the understanding discerns no reality. It is not blind, but there is nothing for it to see.⁴⁰

³⁹ In 1655, the Dutch theologian Franz van der Veken provides a particularly pellucid example of the alignment of positive determinations with light and their absence with shadows: "Hinc jam efficitur rationem infiniti positivam esse, etsi nomine negative exprimatur; nam includit negationem negationis, quae est affirmatio, seu positio, uti negatio tenebrarum est lumen." *Disputationes theologicae de Deo uno et trino, a quæstione prima primæ partis D. Thomae Aquinatis, usque ad quadragesimam quartam* (Antwerp: Plantin Balthasaris Moreti, 1655), disp. VII, c. 2 (p. 111 col. 2), quoted in Igor Agostini, "Ne quidem ratione: Infinità ed unità di Dio in Descartes" (doctoral dissertation, Università di Lecce, 2003), 119.

⁴⁰ Kant's discussion in this Reflection of the sources of illumination thus holds *in nuce* the famous Critical statement of the interdependence of sensibility and the understanding: "Ohne

Instead, the emphasis must fall upon experience as that wherein figures can be distinguished from shadows. This claim, however, runs the risk of reducing Kant's point to a merely epistemic thesis about our cognitive access to realities and negations. Although he insists that the priority of realities cannot be considered in isolation from its relation to cognition, this is not an epistemic point but one concerned with the contribution of our cognitive faculties to the determinations of objects. Kant's thesis cannot be restricted to an epistemic claim because he is concerned with the conditions under which an object can have relational properties, and the possession or lack of a property is a metaphysical determination. As we will see later, this claim about the objects given in sensibility emerges from the model of real opposition introduced in his essay from 1763.

In the final sentence of the Reflection, Kant draws the conclusion that multiplicity is "originary" (*ursprünglich*) for appearances and that unity only arises from an "abstraction" from this multiplicity. Although Kant presents this claim as following from the foregoing analysis, this is the first time he explicitly invokes unity and multiplicity. The connection in the first part of the passage between reality and unity, on the one hand, and between negation and multiplicity, on the other, may be easily reconstructed. Initially, however, the claim seems puzzling, since realities and negations have simply been defined as positive and negative determinations and thus it would seem that there are as many such determinations as there are real properties. Here, Kant refers to reality as a whole, however, because he is starting from the conception of an *omnimoda determinatio*

Sinnlichkeit würde uns kein Gegenstand gegeben, und ohne Verstand keiner gedacht werden. Gedanken ohne Inhalt sind leer, Anschauungen ohne Begriffe sind blind" (A51/B75). Framed in these terms, "negation" means the emptiness of thoughts without sensible content.

developed in the first part of the Reflection. Baumgarten's description of this "Inbegriff aller Realitaeten" explains its unity: "Complexus omnium determinationum in ente compossibilium est *omnimoda eius determinatio*."⁴¹ As Kant writes, the understanding is an "allgemein[es] Licht" and the reality it illuminates is "eine einzige allgemeine." The darkness of negation limits this single light, creates distinctions among objects and thus multiple imperfect beings from a single *ens realissimum*. This alters the model of dependence that Kant established for conceptual priority: when he considers the objects of the senses, neither reality nor negation has unity. Reality is given as a manifold, because finite individual objects can only be delimited within experience. Negation seems to acquire a different meaning in this final sentence: instead of designating the fact that an object has a negative determination, that *x is non-P*, it refers to the non-givenness of *objects* to the understanding.⁴² Kant asserts that unity is only constructed by way of abstraction from the many finite realities given to sensibility through an operation of unification.

On this interpretation, Kant's thesis that negation is primary in the realm of appearance corresponds to the claim that there is nothing prior to objects actually being given to sensibility. But there is another possible reading of this passage, which would

⁴¹ "The complex of all compossible determinations in a being is its *total determination*." Baumgarten, *Metaphysica*, §148, Ak. 17:56.

⁴² As noted, in this Reflection from the early 1770s, Kant claims that objects are not given to the understanding alone but are present in sensibility. This accords with his discussion of the sensible conditions of cognition in the Inaugural Dissertation from 1770. Since in the first *Critique* Kant claims that the spontaneous activity of the understanding is also a requirement for the constitution of objects in sensibility, it would not be correct to speak about objects that are given *either* to the understanding *or* to sensibility (even if Kant is not entirely terminologically consistent). The constitution of an object of experience requires something to be given in intuition but also for these intuitions to be processed by the understanding.

start from the first *Critique*'s conception of a form of sensibility.⁴³ Viewed from the perspective of Kant's account in the Amphiboly of the priority of form over matter, one might align the negations Kant speaks of in Reflection 5270 with the forms of intuition, which are likewise supposed to precede and condition the "matter" given in appearances. This reading is historically plausible, since Kant had already proposed an account of space and time as forms of intuition in the 1770 *Inaugural Dissertation*.⁴⁴ Thus we can distinguish three different types of negations: first, negation in Baumgarten's sense as *non-P* for any reality *P*; second, negation as the non-givenness of objects outside of sensibility; third, negation as the form of sensibility. The final meaning could be said to develop out of the second, for it says that what comes before and conditions the possible givenness of objects is the form of sensibility itself.

Furthermore, the third reading would provide an explanation for Kant's claim that negation is before reality. Kant's phrasing here seems to suggest more than just that objects are first given by the senses: the text implies that there is something that precedes and conditions these objects, negation. Much depends here on whether Kant's statement that "... so ist hier die negation das erste" commits him to the thesis that there can be an informative characterization of what comes before objects given in sensibility.

Interpreting negation as a form of sensibility would provide an explanation for the possibility of significant descriptions. In the Amphiboly, Kant uses his account of the priority of form over matter to explain how negation precedes reality for the objects of

⁴³ In her analysis of this passage, Longuenesse assimilates Kant's position here with his later discussion in the *Critique* and calls these negations the *entia imaginaria*, empty space and time, which have priority over the objects given within them (although they cannot be represented apart from empirical objects). See *Kant and the Capacity to Judge*, 309.

⁴⁴ *De mundi sensibilis atque intelligibilis forma et principiis* (Ak. 2:385–420).

the senses. By equating form and negation, Kant can provide an account of the darkness preceding reality: it is a “leere Anschauung ohne Gegenstand,” an *ens imaginarium* (A292/B349).⁴⁵ Several considerations tell against the third reading of negation in Reflection 5270. First, unlike in the Amphiboly, Kant never refers to negation as form. Second, and perhaps more importantly, interpreting originary negation as form is difficult to reconcile with Kant’s final sentence that the manifold has priority for appearances. The forms of intuition, space and time, are unities. If Kant were asserting here that these forms precede the matter of intuition, then unity would have priority over multiplicity. This objection is not, however, decisive, since one could respond that the unity of negation does not yet *give* objects. When Kant asserts that multiplicity is “ursprünglich,” he might mean that things are *given* only as multiplicities. Even if it is not possible to determine definitively whether negation is to be interpreted as a form of sensibility or as an originary non-givenness, however, these two potential readings clarify the difference between two closely related claims: first, Kant’s contention that negation is more originary than reality for appearances and, second, his thesis that form conditions experience.

Kant’s claim that negation is prior to reality for appearances limits the applicability of a purely conceptual principle. But how can there be an exception to a principle that—since it is derived from mere relations among concepts—is absolutely general? In his answer to this question, Kant introduces an additional requirement for something to have metaphysical, as opposed to merely conceptual, existence. Imposing this necessary condition allows Kant to claim that negation precedes reality for appearances, because he

⁴⁵ See Longuenesse, *Kant and the Capacity to Judge*, 309–310, for a reading of the forms of intuition as the *entia imaginaria* that condition matter.

argues that the principle of complete determination only requires us to have a *concept* of a being whose reality is fundamental. Within the realm of actually existing things, negation can have priority. In other words, the priority of negation is not strictly speaking an exception to the conceptual principle, because within the order of concepts, reality retains primacy. Kant's new condition for objects to have existence over and above the requirements imposed by logic rests on his repudiation of the post-Leibnizian rationalist claim that real possibility is reducible to logical possibility.⁴⁶ As we have seen, for Wolff, Baumgarten, and Meier, realities and negations correspond to affirmative or negative concepts in a judgment. Realities and negations provide the underlying metaphysical bases for the grammatical form of positive or negative predicates. The theory of metaphysical negation is modeled upon grammatical negation, and metaphysical negation thus denotes the non-possession of a positive characteristic, which is interpreted as equivalent to the possession of a negative determination. This picture implies that realities cannot oppose one another, since any conflict between them would involve the logical negation of a reality and thus would not itself be a positive determination.⁴⁷ In his

⁴⁶ It is a vexed question whether Leibniz himself simply equates these two forms of possibility. For a careful and insightful analysis of the complexities of Leibniz's modal theory, see Robert Adams, *Leibniz: Determinist, Theist, Idealist* (Oxford: Oxford University Press, 1994), ch. 1–8. For several critiques of Adams's defense of Leibniz, as well as Adams's response to these objections, see the Symposium on *Leibniz: Determinist, Theist, Idealist* in *Leibniz Society Review* 6 (1996): 61–125. Chignell, "Real Repugnance," 135–138 and 143–152, argues that Kant's denial of the possibility of theoretical cognition of things in themselves derives from his distinction between logical and real possibility. Chignell presents the following sketch of the argument: "1. Our theoretical faculties cannot reliably track the 'real' or metaphysical modality of things without appealing to facts about experience. 2. Thus, we have no way to prove that supersensible things are really possible. 3. But being able to prove that something is really possible is a necessary condition of having theoretical knowledge of its positive properties. 4. Thus, we can have no theoretical knowledge of the positive properties of particular things-in-themselves" (136).

⁴⁷ For a thorough, insightful history of logical and real opposition, see once again Maier's discussion in *Kants Qualitätskategorien*. See also Daniel Warren, *Reality and Impenetrability*.

description of the priority of reality over negation for the understanding at the beginning of the fragment, Kant employs this sense of logical opposition. He denies, however, that the logical relation between reality and negation determines anything about the existence of objects of possible experience. It is this distinction between logical and objective cognition that allows Kant to argue for the reversal of primacy between reality and negation. The mere logical requirement that we must have a concept of an *ens realissimum* does not imply that such a being must exist. But simply stating that real possibility needs more than mere logical possibility does not explain what additional condition must apply for something to be really possible. Kant drives a wedge between concepts and real properties in order to impede the inference from conceptual to actual existence.

2.2 Real opposition and intensive magnitude in 1763

In a short essay from 1763, the *Versuch den Begriff der negativen Größen in die Weltweisheit einzuführen*, Kant claims that there is a gap in the rationalists' argument for the equivalence of logical and metaphysical negation. Once we move from the logical to the objective consideration of reality and negation, conceptual determinations no longer suffice for a metaphysical account of the relation of realities.⁴⁸ Instead, a form of what he calls “real opposition” or conflict between realities becomes possible. Kant argues that the rationalists' objection to really opposed realities depends upon conflating logical and

⁴⁸ See the *Versuch den Begriff der negativen Größen in die Weltweisheit einzuführen*, Ak. 2:167–204. Kant rehearses this argument in his discussion of the second pair of concepts of reflection in the Amphiboly (A264/B320–A265/B231 and A272/B328–A274/B330).

metaphysical properties.⁴⁹ According to Baumgarten, if realities were to conflict, then one of them would have to contain a negation. But in this case it would be a negation and not a reality, contrary to the hypothesis. Kant argues in response that there are two types of opposition: logical and real. A thing cannot possess logically contradictory determinations—i.e. it cannot both have and not have a property. As Kant writes, this “logical opposition” “bestehet darin: daß von eben deselben Dinge etwas zugleich bejahet und verneinet wird” (Ak 2:171). A thing can, however, have realities that stand in “real opposition” to one another, entailing that the consequences of one negate the consequences of the other.⁵⁰ It is a logical truth that an object cannot both have and not have a property at one and the same time, but this does not tell us anything about whether an object can have properties whose consequences⁵¹ cancel one another out.⁵²

⁴⁹ Kant’s argument against the rationalists in the *Versuch* thus relies upon much the same sort of objection he would later use in the *Amphiboly*. In the earlier text, however, he does not claim that the rationalists confused these two forms of opposition because they neglected the role of sensibility. In 1763, Kant did not think that the conditions under which an object could be presented in sensibility presented a limit for cognition.

⁵⁰ See the *Versuch*, where Kant defines real opposition: “Die zweite Opposition: nämlich die reale, ist diejenige: da zwei Prädikate eines Dinges entgegengesetzt sein, aber nicht durch den Satz des Widerspruchs. Es hebt hier auch eins dasjenige auf, was durch das andere gesetzt ist; allein die Folge ist etwas (*cogitabile*)” (Ak. 2:171).

⁵¹ “Consequences” here is a translation of *Folgen*, which I interpret as designating the metaphysical relationship between properties, realities, and forces, on the one hand, and whatever they are taken to ground within the sensible world, on the other.

⁵² In a footnote to her discussion of the *Versuch*, Anneliese Maier argues that Kant’s definition of a real opposition as “nur möglich zwischen Realitäten, d.h. zwischen zwei an sich positiven Prädikaten, sofern beide als positive Gründe eins die Folge des andern aufheben” contradicts another thesis Kant holds: that between realities no opposition is possible. According to Maier, Kant never gives up the latter claim and only finds a way to reconcile these two principles in the *Critical period*. The obvious answer, she notes, would be to claim that Kant does not believe that realities can conflict logically—i.e. both are positive predicates—however they can be opposed in reality. But she maintains that the distinction between logical and real opposition does not save Kant from this difficulty: “Realitäten und Realitäten widersprechen einander niemals, weil beides wahre Bejahungen sind, sie heben einander aber eigentlich auch nicht auf. Folglich ist nach diesem Satz ... auch keine Realrepugnanz möglich; denn aus Realitäten folgen immer nur

For the annihilation of consequences to be possible, realities must be able to ground negations, a claim that stands in opposition to Wolff's, Baumgarten's, and Meier's contention that realities never ground anything except other realities. In the *Versuch*, on the other hand, two conflicting realities can lead to a zero or privation although neither of the components logically negates the other. This relationship of real opposition implies that objects have properties that come in different positive- or negative-valued degrees: it thus implies that objects have properties with *intensive* magnitudes, because extensive magnitudes—composed of parts lying outside one another in space or time—cannot stand in relations of real opposition to one another. For instance, two plane surfaces might stand in real opposition to each other by moving in opposing directions, but, as always having a particular velocity, movement itself requires intensive magnitude. Kant's description also introduces a contrast among several types of “nothing”: the nothing that follows from a logical opposition is a *nihil negativum*, a nothing that cannot be cognized, while the consequence of a real opposition is a representable nothing, a *nihil privativum*.⁵³

Realitäten.” *Kants Qualitätskategorien*, 30. For Maier, this tension is only resolved with Kant's introduction in the *Inaugural Dissertation* of the distinction between *realitas noumenon* and *realitas phenomenon*. Maier does not, however, provide any evidence for the claim that Kant accepted the rationalist precept that “Realitäten folgen immer nur Realitäten” and thus that “sie heben einander aber eigentlich auch nicht auf.” She may wish to argue that Kant's commitment to the *Aufhebung* of one reality by another is incompatible with a different principle Kant held. But I do not see any claim to this effect in her text.

⁵³ In the Table of Nothings in the first *Critique*, the *nihil privativum* and the *nihil negativum* are the second and fourth kinds of nothing. They retain roughly the significance that they possess in the *Versuch*. In the *Critique*, Kant defines the *nihil privativum* as “ein Begriff von dem Mangel eines Gegenstandes, wie der Schatten, die Kälte” (A291/B347) and the *nihil negativum* as a “leerer Gegenstand ohne Begriff” and explains: “Der Gegenstand eines Begriffs, der sich selbst widerspricht, ist Nichts, weil der Begriff Nichts ist, das Unmögliche, wie etwa die geradlinige Figur von zwei Seiten” (A291/B348). The difference between this formulation and Kant's earlier discussion in the *Versuch* lies in the *Critique*'s clear demarcation between concept and object. This allows Kant to define the *nihil negativum* as not possessing a concept and the *nihil privativum* as the concept of the non-existence of something, i.e. of a reality. Note that these are merely two of the

In addition, negation may be further divided into deprivation—the consequence of a real opposition—and lack, where any cause is absent.⁵⁴

The relation of forces illustrates the distinction between logical and real opposition in the *Negative Magnitudes* essay. Forces, however, must have intensive and not extensive magnitudes: they have a strength or degree within a single instant. If, as Kant had argued from his earliest works onward, one is committed to the position that there is a real interaction among forces, then one must account for the relation of opposition that forces with different directions can bear to one another.⁵⁵ In the *Versuch*, as in much of his work, forces with two different directions provide a central example of real opposition and intensive magnitude. It also seems likely that the puzzle of accounting for one force's ability to cancel out another of opposing direction provides the impetus for Kant's theory of both of these concepts. Force provides the first and most prominent instance of really opposing determinations: "Bewegkraft eines Körpers nach einer Gegend und eine gleiche Bestrebung eben desselben in entgegengesetzter Richtung widersprechen einander nicht, und sind als Prädikate in einem Körper zugleich möglich. Die Folge davon ist die Ruhe,

four types of nothing, along with the *ens rationis*, the "leerer Begriff ohne Gegenstand," and the *ens imaginarium*, the "leere Anschauung ohne Gegenstand" (A292/B348).

⁵⁴ There is a further ambiguity in the term "negation": in a logical opposition, negation can stand either for the absence of a positive predicate or for the impossible result of combining a predicate with its contradictory opposite (e.g. something both is and is not in motion). In a "real opposition," by contrast, a negation is only the result of the opposition: neither of the two opposing objects is negative (Ak. 2:175).

⁵⁵ In one of his earliest works, *Gedanken von der wahren Schätzung der lebendigen Kräfte* (1747) (Ak. 1:1–181), Kant attempts to reconcile Leibniz's and Descartes's theories of force by distinguishing between "living" and "dead" force. In both the *Principiorum primorum cognitionis metaphysicae nova dilucidatio* (1755) and the *Metaphysicae cum geometria iunctae usus in philosophia naturali, cuius specimen I. continet monadologiam physicum* (1756), Kant argues against Leibnizian preestablished harmony and for a theory of the real interaction of forces. Kant himself attributes his discovery of negative magnitudes (and real opposition) to the mathematical concept of negative numbers. Whether or not this is the case, the central problem remains the opposition between forces of different directions.

welche etwas (*repraesentabile*) ist” (Ak. 2:171). Forces can conflict with one another; they can possess different determinations, and combining one with another may cancel part or all of their effects. To explain this, Kant applies what he calls the “mathematische Begriff der *negativen Größen*” to realities. In Part I of the essay, he justifies introducing the concept of real opposition into philosophy partially on the basis of its use in mathematics. The signs $+/-$, he argues, implicitly employ the notion of opposing realities, since negative and positive magnitudes are equally real but simply act in different directions. Rather than the Leibnizian calculus of purely additive realities, Kant introduces here the possibility of subtraction.⁵⁶ For Leibniz, only addition of realities is possible because there is merely logical contradiction, so—as purely positive determinations—realities cannot conflict with one another. According to Kant, however, realities can either add or subtract from one another depending upon the relation of these realities. In order to account for the possibility of subtraction as well as addition of realities, some determination of orientation (of $+$ and $-$) is necessary: there needs to be a legend, a sort of “compass rose” for realities to establish this distinction. If we ask what additional factor allows for real opposition, then the example of conflicting forces implies that it is the possibility of differing *directions* that enables a reality to cancel the effects of another reality. Since conflicting realities have intensive rather than extensive magnitudes, Kant

⁵⁶ Ak. 2:172–178. The relationship between negative magnitudes and real opposition provides an example for Kant of the proper application of mathematics to philosophy. In the Preface, he argues that philosophy must learn to employ the insights of mathematics. The final paragraphs of the Preface introduce the concept of negative magnitudes by diagnosing Crusius’s error in criticizing Newton: had Crusius grasped the application of negative magnitude to the theory of attractive and repulsive forces, he would not have accused Newton of absurdity (Ak. 2:169).

introduces a form of non-spatial directionality through his concept of “position” (*positio*).⁵⁷

2.3 Real positing

The first hint Kant provides concerning the role of “position” and “positing” may be found in the concluding lines of the first section of the *Versuch*. In the course of distinguishing the privation that results from a real opposition from the absence that does not come from any repugnance, Kant writes: “Die letztere [absence] erfordert keinen positiven Grund, sondern nur den Mangel desselben; die erstere aber hat einen wahren Grund der Position und einen eben so großen entgegengesetzten” (Ak. 2:178). Kant claims here that real opposition presupposes the ground of a *positing*; the occurrence of positing in this sense requires a supplementary metaphysical connection in addition to the logical relation between a predicate and a subject. The concept of “position” is not only decisive for Kant’s account of negative magnitudes; it also allows him to distinguish between reality and existence, providing the basis for his refutation of the ontological argument for God’s existence in the Transcendental Dialectic of the *Critique* (A598/B626). The role of positing in his refutation of the ontological argument displays

⁵⁷ Kant’s examples emphasize the non-spatiality of real oppositions and thus the inadequacy of spatial orientation. Other than forces, which might seem to be distinguishable on the basis of spatial orientation, he illustrates his discussion through the example of the oppositions between pleasure and pain as well as between virtue and vice. At Ak. 2:180–184, Kant argues that both of these pairs are real, and not merely logical, oppositions. Among the arguments Kant musters for the claim that pain is not just the absence of pleasure but itself a real sensation opposed to pleasure is his calculation of a Spartan mother’s emotional state upon hearing both that her son has fought heroically in battle (resulting in a certain amount of pleasure, say *4a*) and that he has died in battle (which leads to a lesser amount of pain, for instance *a*). The mother will then feel *3a* of pleasure (Ak. 2:181).

essential structural features of the concept of positing in general. Conversely, focusing on Kant's use of the concept of position as he presents it in the *Negative Magnitudes* essay reveals a new complexity in Kant's well-known distinction between reality and existence.

In addition to the *Versuch den Begriff der negativen Größen in die Weltweisheit einzuführen*, Kant composed a text in 1763 entitled *Der einzig mögliche Beweisgrund zu einer Demonstration des Daseins Gottes* (Ak. 2:63–163), in which he introduces the argument that existence is not a real predicate or determination (Ak. 2:72). Instead, he claims, “Das Dasein ist die absolute Position eines Dinges und unterscheidet sich dadurch auch von jeglichem Prädikate, welches als ein solches jederzeit bloss beziehungsweise auf ein anderes Ding gesetzt wird” (Ak. 2:73).⁵⁸ Kant contrasts “absolute” and “relative” positing: in the former, something is said to exist—it is equivalent to *Dasein*—while in the latter, a predicate is merely asserted in relation to a subject, and thus the “positing” is purely logical.⁵⁹ Relative positing is a mere conceptual determination and has no metaphysical purchase. Thus, for Kant, qualitative determination and mere conceptual determination go together. Baumgarten, along with other followers of Wolff, frequently

⁵⁸ Cf. Kant's account in the *Critique*: “*Sein* ist offenbar kein reales Prädicat, d. i. ein Begriff von irgend etwas, was zu dem Begriffe eines Dinges hinzukommen könne. Es ist bloß die Position eines Dinges, oder gewisser Bestimmungen an sich selbst” (A598/B626). For an analysis of Kant's doctrine of *Sein* as position, see Martin Heidegger's “Kants These über das Sein,” in *Wegmarken* (Frankfurt am Main: Klostermann, 1967), 439–473.

⁵⁹ Although Kant is commonly credited with coming up with the notion of existence as an absolute *positio*, this doctrine is found in Erhard Weigel, one of the “conciliatory” philosophers sympathetic to the the “new mechanist philosophy,” with whom Leibniz studied in the summer semester of 1663. Christia Mercer, *Leibniz's Metaphysics: Its Origins and Development* (Cambridge: Cambridge University Press, 2001), 37–38, 104–105 (quotation at 38). See also Ulrich Gottfried Leinsle, *Reformversuche protestantischer Metaphysik im Zeitalter des Rationalismus* (Augsburg: Maro Verlag, 1988), 187–188.

uses *ponere* in both senses without strictly distinguishing between them.⁶⁰ Kant notes, however, that since determinations belong to the *quidditas* of a subject, they are only posited relatively, whereas existence is asserted absolutely of an entity. This allows him to distinguish between existence and predication, but he can also argue that whereas realities admit of degrees, existence—absolute positing—is simple. Something either exists or does not exist, but it cannot exist to a greater or lesser degree. The distinction between relative and absolute position seems to be exhaustive: all “Merkmale” are posited relative to a thing, whereas the thing itself is posited absolutely (Ak. 2:273). Where, however, does the positing and annihilation of opposing realities fit into this picture? In so far as realities can have different degrees, that which they posit also appears to be susceptible to degree. This thesis is confirmed by recalling that forces—which have intensive magnitudes—provide the primary example of realities. “Real positing” cannot, then, be the absolute positing of existence, but just as little can it be reduced to a relative positing where a copula ties a predicate to the subject of a judgment.⁶¹ This is clear from Kant’s distinction between

⁶⁰ See, for instance, Baumgarten’s statement of the principle of sufficient reason: “posito aliquo, ponitur aliquid ejus ratio sufficiens.” *Metaphysica*, §22, Ak. 17:31. Michel Puech argues in *Kant et la causalité: étude sur la formation du système critique* (Paris: Vrin, 1991), 97, that although the Wolffians did not explain their use of *ponere*, it provides the basis for Kant’s doctrine of existence: “Cette interprétation de l’être comme *position* n’est pourtant pas une simple contingence de la langue des wolffiens, ni un simple héritage verbal de la philosophie scholastique, elle prépare une découverte philosophique majeure, la ‘thèse kantienne sur l’être’, c’est-à-dire l’interprétation de l’être comme *position absolue*, parce que la dimension ontologique que prend la question de la causalité chez les wolffiens prépare les éléments d’une philosophie nouvelle, qui dépassera le wolffianisme à partir d’une ontologie nouvelle. Tous les secrets de l’Analytique des principes dans la *Critique de la raison pure* prennent leur source dans ce verbe wolffien, *ponere*.”

⁶¹ Puech disagrees with this, arguing that the concept of position employed in the *Versuch* is a simple, pure positive, that of *Wirklichkeit*: “Par-delà l’intérêt du calcul algébrique sur les forces, qui n’a pas attendu Kant, cette réflexion de 1763 sur l’opposition réelle illustre une nouvelle sensibilité ontologique, l’émergence d’une nouvelle notion première, celle de *Wirklichkeit*, présence effectivement réelle. L’être est une position absolue, un positif absolu, et les *Negative Größen* veulent montrer comment cet être-posé, qui est le siège d’oppositions réelles, est lui-

logical and real opposition and is reinforced by his claim in the General Remark at the end of the essay that “die Beziehung eines Realgrundes auf etwas, das dadurch gesetzt oder aufgehoben wird, gar nicht durch ein Urtheil sondern bloß durch einen Begriff könne ausgedrückt werden” (Ak. 2:204).⁶² So if real positing in the *Negative Magnitudes* essay is neither absolute nor relative, what form can it take?

According to Kant’s account in the *Versuch*, realities are determinations that “ground” a certain state of affairs. This relationship of ground to consequence provides the basis for his theory of real opposition: considered only as properties, two positive determinations cannot conflict, but they may lead to conflicting effects or “positions.” This fundamental consideration allows us to characterize the nature of “real positing”: like the “absolute position” of existence, it consists in an act that exceeds what is contained in the laws of judgment; but in contrast to the simple positing of existence, “real position” has both a magnitude and an orientation. As Kant writes in a Reflection from the 1770s, “realitas est vel comparativa vel absoluta. Realitas phaenomenon non est

même dans son ensemble un pur positif, dont la présence ne saurait ‘qualitativement’ varier: ‘La position dans le monde n’est ni augmentée ni diminuée’” *Kant et la causalité*, 262 (citing Ak 2:195). The sentence Puech cites in support of this claim, however, *does not concern whether reality can submit to gradations!* Rather, Kant argues that the sum total, the “Fazit” of all realities and negations in the world, will always come to 0. In other words, there is a conservation of reality. This is thoroughly unrelated to the question of whether what is posited by a reality submits to gradation. See Ak. 2:194–197. Furthermore, Kant’s many examples of quantifying realities make clear that they can come in different degrees. See, once again, Kant’s discussion of the Spartan mother at Ak. 2:180–181.

⁶² In “Real Repugnance,” 144, Chignell notes that not only determinations of a substance but also the subject itself can be *aufgehoben* because of real repugnance: “In that essay [*Negative Magnitudes*], as well as in The Only Possible Basis essay of the following year, Kant also makes room for a kind of real repugnance that is subject-canceling—i.e., such that any being possessing it is rendered really impossible (and thus “aufgehoben”). Quality-combinations such as being material and thinking, for example, or being a supreme being and being pleased by something outside oneself are said to be real repugnancies that cancel out not just one another, but also their subject as a whole.”

absoluta. e.g. impenetrabilitas” (Refl. 4182, Ak. 17:447).⁶³ The “comparative reality” of phenomena will allow Kant in later writings to explain the existence of bodies in terms of the degree to which space is occupied.⁶⁴ Phenomenal reality thus cannot be characterized by the concept of absolute positing alone: absolute positing correctly determines its modality as actual rather than merely possible, but it does not account for its qualitative determination as possessing gradations. On the other hand, this qualitative determination is not a mere relative positing, because it is an actual (not merely conceptual) determination.

This implies that the distinction between reality and existence is not so simple as it may first appear. Although it may be accurate to say that realities pertain to the *quidditas* of entities, whereas existence responds to the question of *whether* they do, the *Negative Magnitudes* essay presents a third case.⁶⁵ Here, a reality posits or cancels a state of affairs that has a particular amount of a quality. For instance, a force operating with a particular magnitude in a given direction will result in a body accelerating by an amount corresponding to the force divided by the body’s mass. If an opposing force is present, its activity may counteract the first force in an amount proportionate to the second force’s

⁶³ “Reality is either comparative or absolute. The reality of the phenomenon is not absolute. E.g. Impenetrability.”

⁶⁴ See the Dynamic Principle in the *Metaphysische Anfangsgründe der Naturwissenschaften*, II, Erklärung 1 and Anmerkung, Ak. 4:496–497; for an illuminating discussion of impenetrability, see Warren, *Reality and Impenetrability in Kant’s Philosophy of Nature*.

⁶⁵ The simplest and most polemical instance of this version of the distinction is probably Kant’s comparison between a hundred possible and actual thalers, where he argues that the transition from the possible to the actual does not lie in any additional *reality* being added—*what* they are does not differ—but merely in *whether* they have being: “Und so enthält das Wirkliche nichts mehr als das bloß Mögliche. Hundert wirkliche Taler enthalten nicht das Mindeste mehr, als hundert mögliche. Denn, da diese den Begriff, jene aber den Gegenstand und dessen Position an sich selbst bedeuten, so würde, im Falle dieser mehr enthielte als jener, mein Begriff nicht den ganzen Gegenstand ausdrücken, und also auch nicht der angemessene Begriff von ihm sein” (A599/B627).

magnitude. The consequences of the forces are thus determinations of objects in the world but do not involve an “absolute position.” Instead, absent any extraneous forces, Kant conceives of each instance of a force as possessing a determinate magnitude that correlates to its effects in time according to the laws of nature.⁶⁶ Time is required here in order to account for the orientation of these effects—whether they are increases or diminutions of a reality. No such principle of orientation was necessary for Leibniz, since he claimed that all forces increase the amount of reality—the more force, the greater the consequence. While Leibniz certainly recognizes the conflict of phenomenal forces in the world, and hence the possibility for apparent decreases in reality, the interactions we observe do not represent the fundamental structure of the world: at a metaphysical level, all striving tends towards increase. Kant fundamentally revises this Leibnizian theory of one-directional positing by arguing that force is required not only to posit something but also to cease to posit it. This, in turn, allows Kant to claim that realities can counteract one another both partially and fully. But, as already noted, Kant’s account of “real positing” implies a theory of grounding and determination that itself relies upon the existence of time.

In this dynamic account of realities as the sources for differing degrees of position, Kant introduces the notion of change in time. In the third section of the essay, which “enthält einige Betrachtungen, welche zu der Anwendung des gedachten Begriffs auf die Gegenstände der Weltweisheit vorbereiten können” (Ak. 2:189), Kant contrasts two cases

⁶⁶ This account presupposes only that the magnitude of force correlates to the effects over time if the force is unimpeded. In a world in which there are only two forces, F and $-F$, which have equivalent and opposing magnitudes, no effects in time occur. Nevertheless, there is still an implicit relation to time here, because F alone would result in change in time, as would $-F$.

of non-existence: in the first—which, he writes, is easy to understand—something does not exist because its ground is lacking; in the second, however, something no longer exists which once did. In this case, Kant writes, force is required to remove the being or the determination previously posited. He concludes that both generation and diminution rely upon “real grounds”: “Ich sage demnach: *ein jedes Vergehen ist ein negatives Entstehen*, d. i. es wird, um etwas Positives was da ist aufzuheben, eben so wohl ein wahrer Realgrund erfordert, als um es hervorzubringen wenn es nicht ist” (Ak. 2:190). Kant introduces a theory of inertia here according to which a force is required to change something’s state.⁶⁷ A force may therefore bear two relations to a posited state: it may either provide the ground of the position or remove this ground. Through *Entstehen* and *Vergehen*, Kant establishes a directional orientation for forces. As an example, he considers the process of abstraction which leads to “eine Aufhebung gewisser klaren Vorstellungen” (Ak. 2:190). Kant remarks that abstraction requires just as much force as attention and thus may be seen as a “negative Aufmerksamkeit.” By “negative” he means that the activity has an opposite direction from attention. To cancel clear representations, we must engage in the same activity by which clarity was produced, but this activity must change its orientation. Activities thus retain their identity even when their causal direction is reversed.

⁶⁷ Although Kant does not mention inertia in this context, in the much later *Metaphysische Anfangsgründe der Naturwissenschaft*, he grounds the law of inertia using metaphysical concepts of real opposition that are akin to those found in the *Versuch*. It should also be noted that even though Kant describes the state of a body subject to two opposing forces of equal magnitude as “at rest,” there is nothing in his theory that would prevent him from acknowledging that a body may continue in uniform motion absent any force. Relative to the two forces, we would still be able to say it was “at rest.” It would merely be relative to a fixed inertial frame that it could be judged to move. For his mature theory of inertial frames and balancing forces, see the *Metaphysische Anfangsgründe*, I, Ak. 4:480–495.

Most essentially, however, both *Entstehen* and *Vergehen* implicitly rely upon an oriented, linear time, which can be filled or removed through positing and cancelling. Realities come to be or pass away depending upon their relation to a successive temporal order. Importantly, however, whenever a certain degree of reality comes to be or passes away, it is the effect of a process either originating in or resulting from the zero degree. This conception of *Entstehen* and *Vergehen* as processes that correspond in time to the degree of force of the reality that grounds them is central to Kant's later account in the *Anticipations of Perception*, according to which we can imagine any degree of reality gradually diminishing to zero over a duration of time and have a priori cognition of the continuity of intensive magnitudes.⁶⁸ In the *Negative Magnitudes* essay, Kant does not establish any of these consequences of his theory, but his discussions of coming into being and passing away seem to depend upon the existence of time. Instead, Kant concludes the essay by asserting that both "real grounds" and "real oppositions" are equally mysterious. Since there is by definition no conceptual connection between cause and effect or between one reality and an opposing reality, the connection—that which allows for opposition to be possible or for cause to produce an effect—must be an irreducible condition of experience.

⁶⁸ "Nun ist vom empirischen Bewußtsein zum reinen eine stufenartige Veränderung möglich, da das Reale desselben ganz verschwindet, und ein bloß formales Bewußtsein (a priori) des Mannigfaltigen im Raum und Zeit übrig bleibt: also auch eine Synthesis der Größenerzeugung einer Empfindung, von ihrem Anfange, der reinen Anschauung = 0, an, bis zu einer beliebigen Größe derselben" (B208). Here, Kant does not correlate changes of reality in time to amounts of force but instead argues on the basis of the possibility that for any particular degree of reality, a lesser degree could be present. The degree of reality thus does not depend upon increase or diminution in time but upon its place within a continuum. This results, I will show, from Kant's theory of "pure synthesis" in the Schematism.

By the early 1770s, Kant links the distinction between real and logical opposition to that between the phenomenal and the noumenal, to the object thought under the conditions of sensibility versus the thing absent these constraints. In Reflection 4408, for instance, he writes that “Die Übereinstimmung des Begriffs eines entis omnimode realis mit den synthetischen Bedingungen des Denkens scheint keine Schwierigkeit zu haben, weil man zwischen realitatibus noumenis keinen Widerstreit begreifen kann, aber wohl zwischen realitatibus phenomenis” (Ak. 17:535). If there were real oppositions among noumenal realities, then a being with all the realities would not be the most perfect, since some realities would cancel each other out. Furthermore, there might not be a “most perfect” being at all: two beings might possess an equal quantity of reality, or there might be an unending sequence of ever more perfect beings, since there might be an infinite number of realities all conflicting with one another.⁶⁹ Since, however, real opposition occurs only in virtue of the conditions of sensibility, the possibility that an *ens realissimum* exists as noumenon remains unaffected. While the desire to leave open the possibility—but not knowledge of the actuality—of an *ens realissimum* provides a clear theological motivation, Kant has an independent reason for denying the possibility of real opposition among noumena: since noumena are things considered outside the conditions of sensibility, there is no order, no time sequence, through which their determinations can be oriented.⁷⁰ Without some extra-conceptual means of distinguishing a reality that posits

⁶⁹ This is only the simplest case of such sequences resulting from conflicting realities. It illustrates the necessity of guaranteeing non-conflict among realities as a minimal condition for any account of the most perfect being.

⁷⁰ The idea of an *ens realissimum* is also crucial for Kant, because he holds that this idea follows necessarily from the principle of complete determination (Refl. 5269, Ak. 18:138). Also, as he

versus one that cancels a position—without, in other words, some way of interpreting the opposition between the realities—no conflict can take place.

Like Reflection 4408, Reflection 5270 preserves the concept of an *ens realissimum* that would provide the ground of all reality. For such a being, negations would be limitations, and “real opposition” could not occur. With the distinction between logical and real opposition in mind, we can begin to interpret Kant’s claim in Reflection 5270 that the darkness of negation precedes the light of experience for objects of the senses. Negation, in this instance, does not designate limitation but rather the fact that objects are not given prior to sensibility.⁷¹ In this sense, the “originary negation” is a simple non-givenness of objects, as claimed in the second of the three possible readings outlined in §2.1. But the third interpretation—according to which this negation is a form of sensibility—does pick out the condition for objects to be given to the senses. Negation is thus also the zero of sensibility, empty space or time, against which realities can be posited or *aufgehoben*.⁷² Negation as form must be prior to reality in order to ground this possibility of both “real causes” and “real oppositions”: in order for causes and forces to exist, realities must be able to deviate in virtue of something that cannot be analyzed

writes in Refl. 5270, the *ens realissimum* must be an idea of reason, because, for the understanding, reality always precedes negation.

⁷¹ Kant is not always consistent, however, regarding the extension of the term “negation.” In the mid-80s, for instance, he claims that negation is never the lack of a thing but only of the determination of a thing: “Negation ist nicht Mangel der Dinge, sondern der Bestimmung der Dinge. – Realitas, negatio, limitatio; eine jede negatio ist entweder blos limitatio, d.i. oppositum der quantitaet oder negatio repugnantiae und ein oppositum der qualitaet. Was von einem quanto gilt, gilt auch von dem limite quanti; denn die qualitaet bleibt” (Refl. 5815, Ak. 18:361).

⁷² The role of space raises a perplexing question regarding Kant’s account. In some texts, he seems to view either empty time or space as a sufficient condition for the positing of realities. In a Reflection from the mid-1780s, Kant writes: “Voller und leerer Raum” (Refl. 5814; Ak. 18:361). In the Schematism, however, Kant takes positing in time as the sole sensible condition for the application of categories to appearances, and both the Schematism and the Anticipations refer to time as the form in which realities are posited.

through predication. From the perspective of Kant's distinction between real and logical opposition in the *Versuch*, we can see that the most distinctive feature of Reflection 5270 lies in describing a new relationship between reality and negation, on the one hand, and the way in which an object is given, on the other.⁷³ If we examine the kernel of Kant's argument for the change from the logical to the objective priority of reality and negation, we find that it is the manner in which the object is given that yields this result: "Weil Gegenstände der Sinne durch den Verstand nicht (und überhaupt nicht *a priori*) gegeben sind, so ist hier die negation das erste und die Finsternis, aus der das Licht der Erfahrung Gestalten ausarbeitet" (Ak. 18:139). Kant claims here that negation must be primary, because the understanding cannot provide the material of thought but must be supplemented by the "light of experience."

2.4 Intensive magnitude and limits

Kant's definition of intensive magnitudes claims that they differ in two respects from extensive magnitudes: first, they always exist as unities and their implicit multiplicity is

⁷³ This connection between reality/negation and the way in which an object is given occurs simultaneously with Kant's new use of the term "reality" as the opposite of "ideality." Maier identifies the first instance of "reality" as the opposing concept to "ideality" in Kant's essay from 1768, "Von dem ersten Grunde des Unterschiedes der Gegenden im Raume" Ak. 2:275–283. As Maier notes, Kant's new usage may derive from his reading of English philosophy, in particular his study of the Leibniz–Clarke correspondence. Kant continues, however, to employ the rationalist concept of reality and negation alongside the newer terminology. In Refl. 5270, he explicitly refers to this notion of reality; however, these two senses are clearly linked in a manner we will have to examine, since Kant's point is that the way in which an object is given—that is, the way in which it is a reality and not an ideality—reverses the priority of reality and negation. This implies that although Kant is commonly known for distinguishing existence and reality (most famously, claiming in the Transcendental Ideal that existence is not a real predicate and thus that the ontological argument fails), these two concepts are connected for him.

only expressed through the consequences that they ground,⁷⁴ and, second, they do not have *Grenzen* but only *Schranken*. In another Reflection from 1769, Kant describes what is unique about reality and the sensation corresponding to it⁷⁵ by invoking these structural features of intensive magnitudes:

Doch ist das quantum der absoluten position oder realitaet⁷⁶ (Empfindung) darin von anderen quantis unterschieden, daß jenes in nichts verschwindet, diese aber doch eine positive Grenze, obzwar keinen theil übrig lassen. Grenzen des Raumes (dreierlei) und der Zeit (eine). Die Erzeugung der realitaet hat ein Moment, des quanti extensivi ein (quasi) element: differentiale. (Jenes ist wie die Linie anzusehen, die in einer Zeit eine Fläche beschreibt.) Wie ein verschiedenes Moment verschiedene Grade der Geschwindigkeit erzeugt, so verschiedenheit des Eindrucks verschiedenen Grad der Empfindung. intellectual ist aber eine realitaet nicht als Menge verschiedener anzusehen, ist aber mit dem Nichts in continuirlichem Zusammenhange; Theilung der Theile.

(Wir haben 3 quanta. Raum, Zeit und Empfindung (Bewegung, realitaet). Die erste hat ein positives der Grenze, was quantum ist; die zweite, was kein quantum ist, die dritte gar nichts positives und keine grenze, sondern Schranken. realitaet

⁷⁴ Numerous Reflections from the 1770s and 1780s show that Kant views unity and the relation of ground/effect as the defining feature of intensive magnitudes. In Refl. 4411, for instance, he declares: “Die Größe eines Ganzen ist extensiv. Die Größe eines Grundes ist intensiv oder Grad” (Ak. 17:536). In consequence, since the *ens realissimum* must be the ground rather than the sum of all finite realities, it must also have an intensive and not an extensive magnitude: “Die höchste realitaet besteht nicht darin, daß alles in ihr sei, sondern durch ihr als einem grund; denn das maximum der realitaet ist nicht synthetische möglich oder durch coordination, sondern mindere Grade sind nur durch Einschränkung des größten Möglich. Nun ist die höchste realitaet die, welche nicht eingeschränkt werden kan; also ist diejenige welche das Maas aller Dinge ist und darin aller Dinge realitaet liegt, nur die Folge von dem ente summo” (Refl. 3889, Ak. 17:328).

⁷⁵ In Reflections from the 1770s and 1780s, Kant elaborates upon the relationship between phenomenal reality and sensation. Kant claims that “realitas phaenomenon ist, was der Empfindung correspondiert” (Refl. 5814, Ak. 18:361). See also Refl. 5502, Ak. 18:200–201 and Refl. 5526, Ak. 18:208, as well as Refl. 4674 from the Duisburg Nachlass: “Die realitaet muß (in der Empfindung) gegeben sein” (Ak. 17:646). In *Kants Qualitätskategorien*, 33–34, Maier notes that this *realitas phaenomenon* is the *Empfindungskorrelat*. Sensation is a *quantum*, and thus any sensation has a magnitude. In contrast to objects given within the *quanta* space and time, however, sensation and the reality corresponding to it possess an intensive and not an extensive magnitude.

⁷⁶ Kant’s use of “absolute position” as a synonym for “reality” seems to me to be an aberration and does not accord either with his lengthy discussion in the *Beweisgrund* or with his analysis in the *Critique*.

transcendental genommen ist nicht verschiedener Art.) (Refl. 5582; Ak. 18:239–240)

Kant makes several different claims in this Reflection: first, that the difference between the quanta of space and time, on the one hand, and reality, on the other, lies in the fact that the former have “Grenzen,” whereas reality “in nichts verschwindet”;⁷⁷ second, that reality is generated by a “moment,” analogous to the generation of extensive quantities out of differential, although sensation is not multiple; and, third, that reality “considered transcendently” is of the same “kind” as space and time. What is the distinction Kant draws between *Grenzen* and *Schranken*, and what significance would it have for sensation merely to possess the latter?⁷⁸

⁷⁷ Maier argues that Kant should have made the principle of intensive magnitudes dependent upon a pure, qualitative form of apprehension underlying and separable from sensation: “Die synthetischen Grundsätze a priori entstehen insgesamt durch Anwendung der Kategorien auf reine formale, nicht auf empirischen Anschauungen. Sie wären sonst nicht Grundsätze einer möglichen Erfahrung überhaupt, sondern selbst Erfahrungssätze. Folglich muß auch bei den Antizipationen neben der Kategorie eine *reine* Anschauung beteiligt sein. Dabei kann es sich nun nicht um Räumlichkeit und Zeitlichkeit handeln, wie wir festgestellt haben, sondern es müßte eine Art *qualitativer* Anschauung zugrunde liegen, auf die—als reine Apprehension—die Intensitätskategorie Anwendung finden kann.” *Kants Qualitätskategorien*, 62. Maier thus claims that the a priority of the principle of intensive magnitudes implies that it must have a formal basis and that the two forms of intuition Kant supplies—space and time—are insufficient for this purpose. Robert Warren launches several objections to Maier’s proposal. First, he wonders whether it is necessary to think of every quality as possessing an intensive magnitude. Second, and in my view more convincingly, he points to an asymmetry between space and time, on the one hand, and intensities on the other: “We can have a representation of the particular quantity of space a body occupies, emptied of the body itself. But we can have no pure representation of the intensity of a given sensation, emptied of the part that actually affects us. The intensity of sensation is simply the degree to which the subject is affected.” Warren, *Reality and Impenetrability*, 14. Warren’s objection is one consequence of the structural difference between sensation and the other *quanta* that Kant articulates in the *Reflexionen*.

⁷⁸ Both the terms *Moment* and *Erzeugung* point to a difficulty concerning the synthesis of intensive magnitude. In the Anticipations, Kant provides a definition of “moment”: “so nennt man den Grad der Realität als Ursache, ein Moment, z. B. das Moment der Schwere, und zwar darum, weil der Grad nur die Größe bezeichnet, deren Apprehension nicht sukzessiv, sondern augenblicklich ist” (A168–169/B210). The unique feature of intensive magnitudes lies in the *Augenblicklichkeit* of their synthesis. This can only be analyzed on the basis of Kant’s account of temporal determination found in the Schematism.

Sixteen years later in the 1783 *Prolegomena zu einer jeden künftigen Metaphysik*, Kant returns to the distinction between the concepts of *Grenze* and *Schranke*, using this distinction to explain the relation of reason to those concepts of which it can conceive but of which it can have no determinate cognition. Kant does not provide a definition of this distinction but introduces the important characteristics of *Grenzen* in the course of a longer exposition. After posing the question of the peculiar status of objects that exceed the bounds of cognition, Kant starts his discussion of the distinction between *Grenzen* and *Schranken* by stating a precondition for extended beings to have limits: “*Grenzen* (bei ausgedehnten Wesen) setzen immer einen Raum voraus, der außerhalb einem gewissen bestimmten Platze angetroffen wird und ihn einschließt; *Schranken* bedürfen dergleichen nicht, sondern sind bloße Verneinungen, die eine Größe affizieren, sofern sie nicht absolute Vollständigkeit hat” (§57, Ak. 4:352).⁷⁹ *Grenzen* require the existence of a “space” outside a particular place, a space that encloses this determined place, while *Schranken* are mere negations that pertain to any incomplete magnitude. This initial characterization raises a series of questions: Is the space that encloses a particular region of the same nature as that which it encloses? Is the border between the enclosing space and

⁷⁹ While Kant does not define *Grenzen* and *Schranken* in the first *Critique*, the difference is implicit and shapes many of his statements regarding the limits of pure reason. As Manfred Gawlina has effectively established in his *Das Medusenhaupt der Kritik: Die Kontroverse zwischen Immanuel Kant und Johann August Eberhard* (Berlin: de Gruyter, 1996), 102–106, Johann August Eberhard overlooks this distinction in his polemical essays against Kantian philosophy published in the *Philosophisches Magazin*. In particular, Eberhard equates the two in his essay, *Über die Schranken der menschlichen Erkenntnis*. The essay is available in Immanuel Kant, *Der Streit mit Johann August Eberhard*, ed. Marion Lauschke and Manfred Zahn (Hamburg: Felix Meiner Verlag, 1998), 3–15. Gawlina notes that one central, but to my knowledge unstated, aspect of Kant’s distinction rests in the *contingency* of *Schranken*. Gawlina points out that the *Schranken* of human cognition would be a mere *questio facti*: these limitations would only result from empirical facts, while, for Kant, the *Grenzen* of human cognition are the result of a principled, normative inquiry; they are a *questio juris*.

the enclosed region part of the enclosed region, the enclosing space, or both (in other words, is the *Grenze* analogous to a maximum or merely to an upper bound)?⁸⁰ Does the extended being itself determine these limits or do they arise from the enclosing space? Furthermore, does the distinction between *Grenzen* and *Schranken* apply to non-extended objects—and if so in what way?

In the following sentence, Kant indeed extends *Grenzen* to reason, which “sieht gleichsam um sich einen Raum für die Erkenntnis der Dinge an sich selbst,” although it cannot have determinate concepts of these things in themselves but is restricted to appearances. In addition to widening the applicability of *Grenzen* to that which is non-extended, this statement provides an important qualification to the first thesis: the *Raum* presupposed outside of the limited region must be “seen” by the very faculty whose cognition has limits. Kant further elucidates this condition in the following paragraph, contrasting the operation of reason to that of mathematics and natural science. Mathematics and natural science do not have *Grenzen* because their cognition is “gleichartig”: they cannot conceive of a space outside of what they can cognize, since their cognition is all of one kind. In contrast to this, metaphysics contains within itself the means to generate contradictions and become “dialectical” when it attempts to exceed its

⁸⁰ *Grenzen* and *Schranken* can only be analogous to these mathematical concepts, because both maxima and upper bounds are only mathematically defined in terms of an ordering relation upon a set. *Grenzen* and *Schranken*—deriving from the Aristotelian tradition of thought about the continuum—bear a much closer relation to what might be considered a proto-topological conception. For this argument in relation to the continuum in Leibniz, see Samuel Levey, “Matter and Two Concepts of Continuity in Leibniz,” *Philosophical Studies* 94 (1999): 81–119, especially 95–99.

limit (Ak. 4:353).⁸¹ Disciplines of one nature alone can never see that they are “selbst in ihrem inneren Fortgange irgendwo vollendet” (Ak. 4:352), because they cannot see that there is something of another nature, something beyond their own means of cognition.

The *Ungleichartigkeit* of reason allows the limits of reason to emerge as “vollendet,” as complete, because they enclose the sphere of cognition; transcendental ideas lead to the “Berührung des vollen Raumes (der Erfahrung) mit dem leeren (wovon wir nichts wissen können, den *Noumenis*” (Ak. 4:354). It is the “empty space” surrounding cognition that reaches in and touches the “filled” realm of experience: the line at which they touch is the *Grenze*. This description implies a thesis already present in Reflection 5582, the claim that *Grenzen* contain something “positive,” while *Schranken* are “bloße Negationen” (Ak. 18:239–240).⁸² Even though the space outside the realm of experience is empty, the limits of experience are defined. Kant puts this point especially clearly in a Reflection from the late 1770s, where he writes that whatever resides beyond the *Grenze* is nothing for us, because it is outside of all experience: “Die Grenze der Erscheinungen gehört mit zu der Erscheinung, aber das Ding, was die Grenze macht, ist ausser denselben” (Refl. 4958, Ak. 18:41). In the *Prolegomena*, Kant illustrates the claim that limits contain something positive

⁸¹ Kant explains that the purpose of these “dialectical attempts of pure reason” lies in determining the *Grenzen* of cognition: “Allein Metaphysik führt uns in den dialektischen Versuchen der reinen Vernunft (die nicht willkürlich oder mutwilligerweise angefangen werden, sondern dazu die Natur der Vernunft selbst treibt) auf Grenzen; und die transzendentalen Ideen, ebendadurch daß man ihrer nicht Umgang haben kann, daß sie sich gleichwohl niemals wollen realisieren lassen, dienen dazu, nicht allein wirklich die Grenzen des reinen Vernunftgebrauchs zu zeigen, sondern auch die Art, solche zu bestimmen; und das ist auch der Zweck und Nutzen dieser Naturanlage unserer Vernunft, welche Metaphysik als ihr Lieblingskind ausgeboren hat ...” (Ak. 4:352).

⁸² The different forms of negation in *Schranken* and *Grenzen* will be considered later in this chapter and the next. The complexity of Kant’s account, however, can be seen in the connection he draws between the “positivity” of the *Grenzen* and the purely “negative” content of the *noumena* (*Prolegomenon*, §57, Ak. 4:354; B307–312). Furthermore, Kant terms the effect of the concept of *noumena* a “negative Erweiterung” of the understanding (B312).

and, in fact, belong to that which they enclose (they are maxima, rather than upper bounds) by once again using the example of extended objects: “z. B. Fläche ist die Grenze des körperlichen Raumes, indessen doch selbst ein Raum, Linie ein Raum, der die Grenze der Fläche ist, Punkt die Grenze der Linie, aber doch noch immer ein Ort im Raum” (§57, Ak. 4:354).

Here Kant paraphrases his discussion of the *Grenzen* of space from a footnote to §15 of his 1770 Inaugural Dissertation, *De mundi sensibilis atque intelligibilis forma et principis* (Ak. 2:403). In the Dissertation, however, Kant writes that just two of the *Grenzen* of space, planes and lines, are spaces. Points, however, are not parts of space—not themselves spaces—but only *Grenzen*. Moreover, Kant introduces the concept of *Grenze* in the Dissertation in order to establish that the simple is *not* a part of space but only its *Grenze*. In the *Prolegomena*, by contrast, points are considered “places” in space, a determination in tension, if not outright contradiction, with the Dissertation’s contention.⁸³ It is the final sentence of the footnote, however, that stands most openly in opposition to the *Prolegomena*: “Conceptus *termini* non ingreditur aliud quantum nisi Spatium aut Tempus” (Ak. 2:403).⁸⁴ In this earlier usage, *Grenzen* could pertain only to the continuous magnitudes of space and time. Indeed, even in the presentation in the *Prolegomena*, it is not entirely clear how to extend the concept of *Grenzen* to the faculty of reason—for what would be the actual *Grenzen* of reason? Kant speaks of the negative function of the *noumena* and of the operation of the “dialectical attempts of reason,” but where is the

⁸³ The question of the “positivity” of points in space and instants (*Augenblicke*) in time—whether they include any determination at all—will be especially important in our discussion of the Schematism and Anticipations, where the instant of time admits of degrees of “fullness.”

⁸⁴ “The concept of the *limit* does not enter into any *quantum* except for space and time.”

determined, positive limit? What is the outermost determinate cognition of reason?⁸⁵

The meaning of the extension of this spatiotemporal concept to the forms of cognition is not entirely apparent, but, conversely, there seems to be a question concerning the concept of *Grenzen* for the continua of space and time themselves: in what sense can these continua be said to be *ungleichartig*? The answer to this question can be found in that which they contain—that is, whether or not they are “filled.” This interdependence between space and time as the forms of sensible intuition and the reality that fills them leads us back to Reflection 5582, with which this section began and in which Kant first introduces the distinction between *Grenzen* and *Schranken*—for this Reflection specifies the relation among the *quanta* of space, time, and sensation.

In the Reflection, Kant claims that space and time have positive limits that are internally accessible and define them completely: three dimensions define space, and one determines time. These are their *Grenzen* and, in the terms of the Transcendental Aesthetic, constitute them as infinite given wholes. Even though space and time are both infinite, they can be called complete, presumably because they are given as unified forms of intuition. Unlike space and time, however, sensation has no positive limit: nothing serves as its border, as the single dimension of a line does for time and the three dimensions of a solid do for space. This may provide the reason why there could be no form of sensation, for without a positive border, how could it be given as a singular, infinite intuition, a formal intuition as well as a form of intuition? Kant’s claim that “realitaet transcendental genommen ist nicht verschiedener Art” would indicate, then,

⁸⁵ Kant’s discussion here hints at the conclusion that this limit is the cognition of limitation itself—in other words, that cognition is constrained by the limits of experience.

that there is no particular dimension or form for reality or the sensation that corresponds to it. The Reflection, however, does not merely assert that “die Erzeugung der realitaet” does not have a positive limit, but also that it disappears into nothing. When a given distance or amount of time diminishes, it, too, becomes “nothing”: the element of generation for extensive magnitudes is the “differential,” while the parallel element for intensive magnitudes is the “moment.” What, then, is distinctive about this moment of generation from—or disappearance into—the nothing of sensation? While Kant does not specify this difference in the Reflection beyond pointing to the lack of a particular “Art” for reality, elsewhere he provides an indication: “Eine jede realitaet grenzt mit dem nichts auf einer Seite. Denn jede Empfindung füillet die [leere] Zeit und ist [aus] in der leeren Zeit als vom nichts durch continuirliche position entstanden, mithin als continuirliche Größe anzusehen. Die Vernunft hebt von der höchsten realitaet an” (Refl. 4774; Ak. 17:724).⁸⁶ Here, Kant claims that realities do have a boundary, albeit not a positive one; they border on the “nothing.” In the next sentence, he explains that this nothing is the empty time that they border on one side. There are two ways of understanding this discussion of “bordering on one side”: first, the nothing of empty time can be considered that which reality approaches as it diminishes and that from which it originates. Second, although this sense is undoubtedly in play, it is not the only way in which reality borders empty time: empty time provides the dimension, the structuring frame, in which realities can be generated and diminished. Reality arises from a “moment,” from and within an empty time. Just as distance serves as a dimension of space, *time* functions as the form in

⁸⁶ Brackets in original.

which reality is generated through a “continuirliche position.” Reality is *posited*, continuously, in a form—a form which is itself characterized as a type of negation.

3. Positing in Time and the Anticipations of Perception

In the section entitled “Von dem Schematismus der reinen Verstandesbegriffe,” Kant develops a theory of temporal determination—derived, in turn, from his concept of real positing discussed above—and uses it to argue for the claim that realities have an intensive magnitude. This theory of temporal determination bridges the gap between sensibility and understanding by providing the “sensible condition” that appearances must fulfill for the categories of the understanding to be applicable to them (A136/B175). Yet it is not immediately clear what such a “sensible condition” would be, since Kant already established in the Transcendental Aesthetic that the sole sensible conditions of experience given a priori are space and time. The term “sensible condition” must therefore designate something other than the forms of intuition. Furthermore, this “sensible condition” must provide the principle of correspondence between appearances and the categories—the latter, the intellectual conditions of cognition Kant introduces in the first *Critique*.⁸⁷

Although Kant had introduced his theory of space and time as the conditions of sensibility in the 1770 *Inaugural Dissertation*, he first presents the doctrine that there are

⁸⁷ The fact that the Schematism is the first section in the book of the *Critique* devoted to the faculty of judgment constitutes an additional problem. In “The Art of Judgement,” *Mind* 96 (1987): 221–244, David Bell argues that the Schematism must be understood on the basis of the specific task of judgment, which ultimately lies in “an appeal to the workings of the productive imagination, and to the nature of aesthetic experience and creativity” (222). Bell grounds his claim in a broader consideration of the desiderata of a theory of judgment, arguing on largely Wittgensteinian grounds. In my view, however, Bell does not pay sufficient attention to the function of the schemas as rule-governed acts of synthesis, required for any cognition of the objects of experience.

conceptual constraints upon appearances—concepts that have a priori “objektive Gültigkeit”—in the Transcendental Deduction of the first *Critique*. In this section, he argues that the categories, as “Bedingungen einer möglichen Erfahrung,” apply a priori to appearances but not to things in themselves (A139/B178). At first, this might seem to conclude his justification of the conceptual conditions of experience, since the Transcendental Deduction purports to show that the objects of experience are necessarily such that the categories can be legitimately applied to them.⁸⁸ In the Schematism, however, Kant introduces a puzzle: how can the categories be applied to appearances when they are “ganz ungleichartig, und können niemals in irgend einer Anschauung angetroffen werden” (A137/B176). Unlike empirical concepts, the categories cannot be directly presented in intuition. There is a homogeneity between empirical concepts and

⁸⁸ Allison provides a comprehensive discussion and refutation of this objection in *Kant's Transcendental Idealism*, 202–204. First, he considers H. A. Prichard's argument that the entire second book of the *Transcendental Analytic* is “superfluous” because “if Kant is in a position to lay down that the categories must apply to objects, no special conditions of their application need to be subsequently determined.” See H. A. Prichard, *Kant's Theory of Knowledge* (Oxford: Clarendon Press, 1909), 246–247. In the subsequent discussion, Allison cites two other versions of this problem, J. G. Warnock's charge (in “Concepts and Schematism,” *Analysis* 8 (1949): 77–81) that “the presence of this chapter in the *Critique* is due entirely to Kant's illicit separation of the possession of a concept from the ability to use it” and Jonathan Bennett's related accusation (see Bennett, *Kant's Analytic*, 150). Allison rejects these objections because he claims that they misconceive the nature of Kant's question in the Schematism: “The question the Schematism addresses is not *whether* the categories apply to appearances (that question is dealt with in the Deduction) but under what (sensible) *conditions* they can do so. Moreover, the question is both perfectly coherent and largely unaddressed by the Deduction. To know that the concept of quantity is applicable to appearances is not yet to know that the objects to which it applies are extensive magnitudes and that all appearances are such magnitudes. The latter condition requires the additional knowledge of how this concept is expressed in sensible terms, that is, how it is schematized. The same holds, *mutatis mutandis*, for the other categories.” *Kant's Transcendental Idealism*, 203. Allison's correction is clearly warranted, but the question remains of the nature of this “sensible condition.” He provides a clue when he writes that the “condition” for the application of quantity requires that we know how the concept is “expressed in sensible terms.” The problem of the Schematism is how to understand this idea of a “sensible expression” of an intellectual condition.

pure intuitions, because empirical concepts are derived from empirical intuitions, which already have sensible form. Thus, empirical concepts can be spatiotemporally determined and thus exhibited in pure intuition.⁸⁹ The categories, on the other hand, are not abstracted from empirical intuitions but are derived from the logical forms of judgment alone. How, then, can these discursive conditions be “expressed” in sensible terms? Kant seeks a “third” to mediate between the pure concepts of the understanding and appearances, and he claims to find it in temporal determination (A137/B176–A138/B177).⁹⁰

Kant only devotes a brief paragraph to presenting this *Ungleichartigkeit*, before quickly introducing the possibility of a third that would be both “intellectual” and “sensible,” naming it a “transcendental schema” and then claiming that time fills this role.

⁸⁹ Kant introduces the example of the empirical concept of a plate to illustrate this point: “So hat der empirische Begriff eines *Tellers* mit dem reinen geometrischen eines *Zirkels* Gleichartigkeit, indem die Rundung, die in dem ersten gedacht wird, sich im letzteren anschauen läßt” (A137/B176). Allison provides a helpful gloss of this passage: “This indicates that it is the possibility of exhibiting the geometrical concept in pure intuition (constructing a circle) that supposedly explains the homogeneity between it and objects, such as plates, given in empirical intuition, as well as the empirical concepts that are formed by abstraction from the content of such intuition (“thought in the latter”). The homogeneity, in short, is between pure and empirical intuition, not between a class concept and a member of that class.” *Kant’s Transcendental Idealism*, 212.

⁹⁰ In his canonical 1914 article on the Schematism, Ernst Robert Curtius argues that Kant mixes several different models for conceiving of the problem of the relationship between the intellectual and the sensible. In Curtius’s reconstruction, Kant’s formulation of the need for a *tertium* forms part of his failed initial attempt to construe the relationship between intuitions and concepts in terms of subsumption. According to Curtius, subsumption—itsself containing an ambiguity between a notion of judgmental and syllogistic subsumption—presents a false start; instead, Curtius argues that the proper line of the Schematism employs the model of synthesis. See Ernst Robert Curtius, “Das Schematismuskapitel in der Kritik der reinen Vernunft: Philologische Untersuchung,” *Kant-Studien* 19 (1916): 338–366. Allison agrees with Curtius’s differentiation between two types of subsumption but argues that the latter, syllogistic conception of subsumption is compatible with Kant’s subsequent characterizations of schemas as rules of synthesis; see *Kant’s Transcendental Idealism*, 210–218. As will emerge in what follows, the present reading will shift the focus from subsumption to the relation between intuitive containment and discursive containment. In my view, it is the task of the Schematism to mediate between these two relations.

The difficulty of finding something that possesses two *ungleichartige* natures should not, however, be underestimated: Kant is at pains to show that transcendental determination is *gleichartig* with both the intellectual and the sensible, but he has defined these two faculties through incompatible characteristics. In the *Jäsche Logik*, for instance, Kant writes: “Die Anschauung ist eine *einzelne* Vorstellung (*repraesentatio singularis*), der Begriff eine *allgemeine* (*representatio per notae communes*) oder *reflectirte* Vorstellung (*representatio discursiva*) (Ak. 9:81).⁹¹ It thus seems that for this third to participate in both the sensible and the intellectual, it would have to be both singular and general. Kant’s response to this should be quoted in full, on account both of the intricacy of his argument and of the lengths to which he goes to establish rhetorically the status of this “third”:

Der Verstandesbegriff enthält reine synthetische Einheit des Mannigfaltigen überhaupt. Die Zeit, als die formale Bedingung des Mannigfaltigen des inneren Sinnes, mithin der Verknüpfung aller Vorstellungen, enthält ein Mannigfaltiges a priori in der reinen Anschauung. Nun ist eine transzendente Zeitbestimmung mit der *Kategorie* (die die Einheit derselben ausmacht) so fern gleichartig, als sie *allgemein* ist und auf einer Regel a priori beruht. Sie ist aber andererseits mit der *Erscheinung* so fern gleichartig, als die *Zeit* in jeder empirischen Vorstellung des Mannigfaltigen enthalten ist. Daher wird eine Anwendung der Kategorie auf Erscheinungen möglich sein, vermittelt der transzendentalen Zeitbestimmung, welche, als das Schema der Verstandesbegriffe, die *Subsumtion* der letzteren unter die erste vermittelt. (A138/B177–A139/B178)

⁹¹Allison dismisses this problem, writing “Moreover, it cannot be objected that such a ‘solution’ is purely verbal, since it requires that a single representation possess what for Kant are the supposedly incompatible properties of being sensible and intellectual. This is to conflate the valid taxonomical point that no representation can be both a concept and an intuition with the dubious claim that, given Kant’s radical separation of the faculties, no representation can combine within itself both sensible and intellectual components. Indeed, the discursivity thesis not only allows for such a combination, it requires it.” *Kant’s Transcendental Idealism*, 215. Allison’s own solution here seems “purely verbal” since he skirts the central issue: how can a representation have “sensible and intellectual components,” when incompatible properties are used to define the sensible and the intellectual?

The verb “enthalten” links the concept of the understanding to the formal condition of inner sense. Kant’s use of the singular “Verstandesbegriff” should be interpreted not as a deviation from the plurality of the categories—as though there were some separate concept of the understanding introduced here for the first time—but as a statement of a general property of all the categories, in fact, their property of generality. This is already implicit in the Transcendental Deduction when Kant argues that all the categories must be applicable to appearances for appearances to form part of *one* experience. Despite the plurality of categories, therefore, they are all unified under the “I think” as the condition of possibility of a united experience. The concept of the understanding contains the “pure synthetic unity of the manifold,” while time contains an a priori multiplicity in intuition. Time is a *condition* for the linking of the manifold, while the category makes it into one. In fact, it seems that the concept of the understanding is nothing other than the most general principle of unification of the many: it is the “container” of the many in the sense that it simply provides the criteria for containment as such. On the other hand, as he makes clear with his qualifying phrase, “als die formale Bedingung des Mannigfaltigen des inneren Sinnes, mithin der Verknüpfung aller Vorstellungen,” Kant begins by referring to time as a form and then repeats the transition first presented in the Transcendental Aesthetic to the pure intuition of time. The formal intuition “contains” time in the same sense as that in which space contains spaces, as discussed in the Transcendental Aesthetic: “Er ist wesentlich einig, das Mannigfaltige in ihm, mithin auch der allgemeine Begriff von Räumen überhaupt, beruht lediglich auf Einschränkungen” (A25/B39). The many spaces (and, in this case, times) are limitations of a prior,

continuous whole given a priori. These two senses of containment thus track the distinction between the intellectual and the sensible.

In the following sentence, however, Kant switches from this familiar time of pure intuition to the term “transzendente Zeitbestimmung,”⁹² which shares with the category both generality and a basis within an a priori rule. Kant’s reliance upon a “rule” here stems from his claim in the introductory section of the *Analytik der Grundsätze* that the application of the concepts of understanding to appearances requires the faculty of *Urteilkraft*, which provides principles—rules for their application.⁹³ Transcendental temporal determination and the category are “gleichartig” in that both rely on such a rule for their application. Kant has not yet explained what temporal determination could be, but merely states the properties it shares with the concept and the appearance. He

⁹² In §24 of the B Edition of the Transcendental Deduction, Kant calls the synthesis of the manifold of intuition required for the application of the categories to what is given in intuition “figurative” synthesis or *synthesis speciosa*” (B151). As Curtius shows, §24 concerns the same problem as that addressed in the Schematism: what must be true about appearances for the categories to be applicable to them. “Das Schematismuskapitel,” 342–343.

⁹³ The *Grundsätze* provide the a priori rules for the application of the categories. In the initial section, Kant remarks on the incongruity between these principles and all rules for the application of empirical concepts. Only in transcendental philosophy can not only the rules but also the conditions of application to particular cases be given a priori. For empirical concepts, in contrast, the application to particular cases is more a matter of art than of knowledge (A133/B172). In “The Art of Judgement,” Bell raises a concern regarding the characterization of schemas as rules. Simply describing schemas as rules does not get at the fundamental problem of the Schematism, which, in his view, is the “apparent paradox ... of a *rule-determined spontaneity*. And, more generally, the philosophical problem here concerns the seeming impossibility of ascribing to subjectivity an ineliminable role in judging, without thereby imperiling the very possibility of judgements that are objective” (222). Bell takes aesthetic judgment as the model for understanding the Schematism: “the productive imagination can discover in the diversity of sensory experience a formal unity that is not grounded in rules, that cannot be explained by appeal to objects, images, or other determinate particulars, but that is a subjective yet universal condition of the applicability of the concept of the object in general” (230). However suggestive, Bell’s reading occludes the importance of Kant’s characterization of schemas as rules for the constitution of appearances: far from being a subjective condition of the applicability of the concept of the object, the schemas are constitutive synthetic features of the formation of objectivity itself.

establishes its common nature with the latter by remarking that time is itself contained in every empirical representation. It is here that Kant introduces his *tertium*: it is his third use of “containment” that mediates the previous two. Temporal determinations are “contained” in every appearance as such in the sense that any representation whatsoever must occur in the form of time. If, then, there is a general form of the determination of time—a way in which time must be combined to constitute a unity—it will be found in every appearance, but it will also be intellectual because it will be a rule for the constitution of unity itself. Kant concludes the paragraph with a clause beginning with “daher”: transcendental temporal determination is capable of bridging concept and appearance because it is both particular in being actually contained in each representation but is also general, like the category, because it contains a rule for the determination of unity as such.⁹⁴

But it seems that the “transcendental temporal determination” threatens to collapse into two parts, because of the heterogeneity of its sensible and intellectual components: its sensible aspect is a formal intuition, contained in every representation, while its intellectual aspect is a rule of synthesis.⁹⁵ In what sense can these two principles

⁹⁴ Kant’s description of this process as a “subsumption” has—as already mentioned—been a focal point for much commentary. See both Curtius, “Das Schematismuskapitel,” 344–350, and Allison, *Kant’s Transcendental Idealism*, 210–213. Despite their differences, both agree that determining the model of subsumption Kant had in mind is crucial for deciphering the structure of the Schematism. While this is helpful, a further question concerns the specific form of homogeneity Kant constructs in this passage.

⁹⁵ Walter Zschokke presents this objection in a particularly lucid form: “Das Schema sollte nach Kant ein Drittes sein zwischen Anschauung und Verstandesbegriff, und worin besteht es tatsächlich? Es ist nichts mehr und nichts weniger als die Verbindung von Anschauung und Begriff selber, die doch eben das Problem war: die Zeit ist die Anschauungsform, die Kategorie ist der Verstandesbegriff, das Schema ist eine Vereinigung beider, sonst nichts; anstatt eines Dritten, welches wir suchten, legt Kant Eins und Zwei kurzerhand zusammen. Das Problem wird dadurch höchst einfach gelöst, dass es ignoriert wird. So heterogen Anschauung und Begriffe sein mögen,

of combination be themselves combined into a *single*, unified entity? Kant's description a paragraph later provides a clue to the sort of unity possessed by the schema: it is unified as a single activity of determining sensibility as such: "Das Schema ist an sich selbst jederzeit nur ein Produkt der Einbildungskraft; aber indem die Synthesis der letzteren keine einzelne Anschauung, sondern die Einheit in der Bestimmung der Sinnlichkeit allein zur Absicht hat, so ist das Schema doch vom Bilde zu unterscheiden" (A140/B179).⁹⁶ Unlike any singular intuition, the sole unity of the schema lies in its function *in the determination of sensibility*. While an image unifies a particular intuition, the schema is responsible for the whole of sensibility falling under a single rule of determination.⁹⁷ *Temporal* determination provides unity to the very *determinations* of sensibility. It is thus crucial to see that what mediates between the category and the appearances is not simply "time"—and, in particular, not time as form—but, instead, a determination of the many individual intuitions as all following a particular rule, which creates a unified experience

wie Kant zunächst behauptete, im Schema verbindet er sie durch den Machtspruch: fügt euch zusammen. Das dritte zur Anwendung wird Kant unter den Händen die Anwendung selber." Zschokke, "Über Kants Lehre vom Schematismus der reinen Vernunft" *Kant-Studien* 12 (1907): 169, cited in Curtius, "Das Schematismuskapitel," 361–362.

⁹⁶ For the schema to be a product of *Einbildungskraft* implies that its activity consists in the affection of inner sense whose structure Kant describes in §24.

⁹⁷ Later in the Schematism, Kant provides a fuller description of this contrast: "das *Bild* ist ein Produkt des empirischen Vermögens der produktiven Einbildungskraft, da *Schema* sinnlicher Begriffe (als der Figuren im Raume) ein Produkt und gleichsam ein Monogramm der reinen Einbildungskraft a priori wodurch und wornach die Bilder allererst möglich werden, die aber mit dem Begriffe nur immer vermittelt des Schema, welches sie bezeichnen, verknüpft werden müssen, und an sich demselben nicht völlig kongruieren. Dagegen ist das Schema eines reinen Verstandesbegriffs etwas, was in gar kein Bild gebracht werden kann, sondern ist nur die reine Synthesis, gemäß einer Regel der Einheit nach Begriffen überhaupt, die die Kategorie ausdrückt, und ist ein transzendentes Produkt der Einbildungskraft, welches die Bestimmung des inneren Sinnes überhaupt, nach Bedingungen seiner Form, (der Zeit,) in Ansehung aller Vorstellungen, betrifft, so fern diese der Einheit der Apperzeption gemäß a priori in einem Begriff zusammenhängen sollten" (A142–142/B181). This passage is also important, because Kant explicitly states that the schema is, as we have claimed, a transcendental product of imagination.

encompassing every individual intuition.⁹⁸ As Kant writes at the end of this paragraph: “Diese Vorstellung nun von einem allgemeinen Verfahren der Einbildungskraft, einem Begriff sein Bild zu verschaffen, nenne ich das Schema zu diesem Begriff” (A140/B179–180). The productive imagination possesses a general procedure for the creation of an image for any specific concept; the schema cannot itself be turned into an image but is instead a “pure synthesis” (A142/B181). This pure synthesis allows us to pass from a concept to an object falling under it.

The distinction between pure and empirical syntheses provides the key to understanding Kant’s argument in the Anticipations of Perception, for it allows Kant to reply to a dilemma concerning the nature of the synthesis he introduces here, arising from his discussion of the “Apprehension” that “erfüllet nur einen Augenblick.” It seems that such a synthesis could neither occur over time nor occur within an instant. On the one hand, as an a priori determination of the real, it must condition the empirical flow of time and thus cannot itself take time (A167/B209). On the other, as a process of synthesizing, it would appear to constitute change and thus require temporal extension. Kant’s perplexing notion of an instantaneous synthesis relies upon his discussion of the

⁹⁸ Kant’s characterization of temporal determination as a unifying rule suggests a response to Maier’s complaint of equivocation. In her exposition of the Schematism, Maier writes: “die Zeit ist vom Standpunkt einer logisch-erkenntnistheoretischen Betrachtung aus einerseits die Form des inneren Sinnes, in die sich unsere Bewußtseinsinhalte als solche einordnen, andererseits aber auch eine Ordnungsform der *äußeren* Erscheinungen, die sich die *Empfindungsinhalte* einfügen.” *Kants Qualitätskategorien*, 51. Maier goes on to explore the problems that result from Kant’s putative confusion of time as a form of inner sense and the time of the contents of sensation. She does not consider, however, the role Kant claims is played by temporal determination: that of unifying *all* representations. On the previous page, Maier admits that the form of time is common to all intuitions, whether through the outer or the inner sense. Her doubt, however, might be rephrased as skepticism concerning the possibility of unifying all intuitions according to schemas, when outer intuitions are constituted not only by time but also by space.

schema of reality. His discussion of pure synthesis in the Schematism reveals that categorial syntheses condition experience itself. Although an instantaneous synthesis may not be imaginable within experience, it must underlie any experience of degrees of reality. Another way of demonstrating this point is to consider Kant's argument that the pure synthesis of the apprehension of intuition *generates* time. After presenting his definition of a schema as pure synthesis, Kant switches from "category" to "categories" and briefly introduces the schemas of each of the four groups of concepts. The schemata must be multiple, because there is an irreducible multiplicity of categories derived from the different forms of judgment. The only absolute unity is that of the empty "I think." While Kant can refer to the "concept of understanding" and its schema as an abstraction, there is no general form of unification that would be common to all the categories. Number provides the schema for the categories of quantity. Number is the activity of combining a multiplicity of homogenous units into a single whole: "Also ist die Zahl nichts anders, als die Einheit der Synthesis des Mannigfaltigen einer gleichartigen Anschauung überhaupt, dadurch, daß ich die Zeit selbst in der Apprehension der Anschauung erzeuge" (A143/B182). The activity by which "I" generate time is the "Apprehension der Anschauung"; time arises, Kant argues, from the application of the schema of quantity.

From here, Kant provides the definition of "reality" as corresponding to sensation familiar from his Reflections from the 1770s and 1780s and glosses this as "dasjenige also, dessen Begriff an sich selbst ein Sein (in der Zeit) anzeigt. Negation, dessen Begriff ein

Nichtsein (in der Zeit) vorstellt” (A143/B182).⁹⁹ Kant is able to provide this paraphrase because the schema bridges the gap between concept and intuition: it provides a representation to accompany the concept. At first glance, Kant’s definition of reality as indicating “ein Sein” may seem to contradict his distinction between reality and existence, since only existence and not reality can designate being. There is a corresponding ambiguity in Kant’s use of the term “negation.” In Reflection 5815 from the early 1780s, Kant writes: “Negation ist nicht Mangel der Dinge, sondern der Bestimmung der Dinge.” How can negation in the Schematism name a “Nichtsein” and in the Reflection a “Mangel ... der Bestimmung der Dinge”? While it might be possible to answer this question by claiming that Kant is using two different senses of negation here or that his Reflection does not articulate his settled view but was instead merely a position he was considering, neither of these strategies answers the corresponding question of whether Kant’s definition in the Schematism confuses reality with existence. The concept of “real position,” however, familiar from the 1763 essay, provides another solution to this: the *Sein* picked out by reality is not the existence of an entity and is not a determination of the entity’s modal status at all. Instead, it is the determination that some quality is present; it is *what* can be sensed.

The following sentence articulates the relation between reality and negation in terms of a peculiar type of opposition in a single time: “Die Entgegensetzung beider [Realität und Negation] geschieht also in dem Unterschiede derselben Zeit, als einer erfüllten, oder leeren Zeit” (A143/B182). The counter-positioning (*Entgegensetzung*) of

⁹⁹ See the Reflections considered at the end of the previous section, e.g. Refl. 5502, 5814, 5526, and 4674 from the *Duisburg Nachlass*.

reality and negation thus can only occur because an instant of time has the capacity for two different determinations: it can be either “filled” or “empty,” and thus can indicate a distinction between reality and negation.¹⁰⁰ If, as Kant argues in the previous paragraph, one generates time through the composition of homogenous unities, these unities must nevertheless be capable of receiving reality, of becoming filled or empty time. But how is this “filling” to be reconciled with the conception of time as composed of simples? Kant once again invokes the model of form and matter. In the following sentence, he explains that while time is a form, what corresponds to sensations in the object is the “transzendente Materie aller Gegenstände, als Dinge an sich (die Sachheit, Realität)” (A143/B182). This sentence seems to indicate that reality is the “transcendental matter” of things in themselves, but most commentators read “Dinge an sich” as “empirical things in themselves.”¹⁰¹ This “matter” is the inheritor of Baumgarten’s and Wolff’s concept of matter as real, positive determinations: it is not the determinable, but, once again, the determination. Kant thus employs at least two different distinctions between form and matter: in the Amphiboly, as we have seen, form provides the determination, while, here, it is transcendental matter, the reality corresponding to sensation, that does so.

¹⁰⁰ As Guyer argues in a passage quoted at the beginning of this chapter, the possibility of intensity relies, essentially, on the real opposition, the *Entgegensetzung*, of reality and negation within objects. See *Kant and the Claims of Knowledge*, 198.

¹⁰¹ Longuenesse, for instance, writes: “It is thus natural to suppose that ‘things in themselves,’ in the passage from the Schematism, should be understood as *empirical* things in themselves, objects we represent to ourselves as distinct from our representations, but which nonetheless are given only as appearances (phenomena) ‘corresponding to’ our representations.” *Kant and the Capacity to Judge*, 301. She then claims that the Aesthetic implies that the matter of appearances is affected by the transcendental thing in itself so “the *synthesis speciosa* reflected in the category of reality should be understood as an act of ‘filling’ our temporal intuition with a ‘matter’ whose ground is ultimately the thing in itself” (301–302).

The final two sentences of his discussion then specify how the schema of reality determines the quantity of this matter:

Nun hat jede Empfindung einen Grad oder GröÙe, wodurch sie dieselbe Zeit, d.i. den innren Sinn in Ansehung derselben Vorstellung eines Gegenstandes, mehr oder weniger erfüllen kann, bis sie in Nichts (= 0 = negatio) aufhört. Daher ist ein Verhältnis und Zusammenhang oder vielmehr ein Übergang von Realität zur Negation, welcher jede Realität als ein Quantum vorstellig macht, und das Schema einer Realität, als der Quantität von Etwas, so fern es die Zeit erfüllt, ist eben diese kontinuierliche und gleichförmige Erzeugung derselben in der Zeit, indem man von der Empfindung, die einen gewissen Grad hat, in der Zeit bis zum Verschwinden derselben hinabgeht, oder von der Negation zu der GröÙe derselben allmählich aufsteigt. (A143/B182–183)

As in the schema of quantity, Kant refers to the schema as the activity of *generating* something, in this case, the generation of reality in time. Kant supports his claim (“Daher ist ein Verhältnis ...”) on the basis of his discussion of sensation. He states, without argument, that every sensation has a degree that can vary in its “filling” of time in inner sense.

This seems to open Kant to a charge of psychologism: does he attempt to construct a transcendental argument on the basis of a (purported) fact about the nature of sensation? Indeed, psychologists including G.T. Fechner and E.H. Weber would deny that this is a fact about sensation at all, claiming instead that sensation contains thresholds such that we are incapable of distinguishing between a sensation falling below this threshold and the absence of sensation. If this were the case, then sensation would not be continuous, because there would be a smallest noticeable sensation.¹⁰² This danger haunts

¹⁰² “[E]s zeigt sich vielmehr, dass jeder Reiz wie Reizunterschied schon eine gewisse endliche GröÙe erreicht haben muss, bevor die Merklichkeit desselben nur eben beginnt, d.h. bevor er eine unser Bewusstsein merklich afficirende Empfindung erzeugt oder einen merklichen Empfindungsunterschied begründet.” Gustav Theodor Fechner, *Elemente der Psychophysik* (Leipzig: Breitkopf und Härtel, 1860), 1:238. For E.H. Weber’s analysis of the “smallest

Kant's discussions in the Schematism and Anticipations and cannot be easily answered. Indeed, Hermann Cohen, one of the most sympathetic commentators of the Anticipations, viewed Kant as committing a psychologistic error in attributing a degree to sensation, rather than simply to the reality corresponding to that sensation.¹⁰³ But it should be noted that Kant is not claiming that the subject can distinguish differences between any two degrees of sensation, no matter how "close" together they might be. Nothing in Kant's statement commits him to the view, disputed by psychophysical theories in the nineteenth century, that we can detect minute differences in sensation. All Kant claims is that sensation "fills" inner sense at a particular time, and thereby the representation of an object, to a greater or lesser degree. The "Nichts" serves as a limit to this diminution, for, given any particular degree of sensation, there is no principled reason why it could not be lessened: even if it turns out to be the case that our nervous system is constituted such that we can only discern sensations above a certain threshold,

differences" that can be perceived, see his *Der Tastsinn und das Gemeingefühl*, ed. Ewald Hering (Leipzig: Wilhelm Engelmann, 1905), 115–117.

¹⁰³ In Cohen's view, the claim that reality has a degree can be established independently of any claim regarding sensation and can be justified on a priori grounds. See Cohen's analysis in *Kants Theorie der Erfahrung*, 3rd edn., *Werke*, 1:538–563. Longuenesse goes to great lengths to discount Cohen's claim, writing: "As for the representation of sensation as capable of passing through an infinite number of intermediate degrees before disappearing into *nothing* = 0, it is certainly not a psychological *datum*, but a mere possibility, whose representation is generated a priori by the application of mathematical synthesis to the *continuum* of the temporal form in which sensation is posited." *Kant and the Capacity to Judge*, 319. Longuenesse's claim does not seem to address this passage in the Schematism, since Kant starts from sensation's capacity to "occupy inner sense more or less completely" in a single instance and does not appear to relate this capacity to the temporal continuum. In general, Longuenesse reconstructs Kant's argument as deriving the continuity of reality from the continuity of time. As will be clear in what follows, I do not think this is accurate textually, nor do I think it functions as an argument (as Longuenesse concedes).

we can nevertheless imagine a decrease of sensation, a fading of the sensation into nothing.¹⁰⁴

The argument may nevertheless seem to be empirical and not transcendental.¹⁰⁵

An analogy with force, however, diminishes this impression: as we have seen, at the

beginning of the Transcendental Aesthetic, Kant defines sensation as “Die Wirkung eines

¹⁰⁴ Jonathan Bennett offers an interesting proposal for interpreting Kant’s claim that sensations are continuous. Bennett distinguishes between “noticeably distinct” and “discoverably distinct” differences: “A *difference* is *discoverable* if it can be detected by any means whatsoever; but it is *noticeable* only if it can be detected by simple inspection—by having the different pains, feeling the different temperatures, looking at the different colored surfaces, and so on” and then interprets Kant’s contention as amounting to the thesis that “between any two *noticeably* distinct degrees of intensity there is one which is discoverably distinct from both.” *Kant’s Analytic*, 176–177. Bennett does consider a stronger version of Kant’s claim, according to which “between any two *discoverably* distinct degrees of intensity there is one which is discoverably distinct from both” but rejects it as “extravagant” (177). While Bennett’s distinction is helpful in combating the straightforward but implausible reading of Kant as holding that there is a continuum of sensation, he nevertheless reduces Kant’s argument to an empirical one. I will suggest a way of reading Kant’s claim that appears to account more adequately for the transcendental character of his argument. H.J. Paton also makes a distinction similar to Bennett’s in his discussion of thresholds: “The physical stimulus can be gradually increased for some time before we recognize any change in the sensible quality, but I doubt whether that proves change of sensation to be discontinuous. The sensation may vary continuously with the stimulus even when the variation is not perceptible. The fact that we can watch a moving body for some time—for example, the sun or the hands of a watch—without recognizing that there is a change of position does not prove that motion is discontinuous; and the same principle may, I think, hold also of change in the perceived qualities of objects.” Paton, *Kant’s Metaphysic of Experience* (London: Routledge, 2002), 2:145.

¹⁰⁵ Bennett presses this objection, writing: “This [that sensations have a sliding scale of intensive magnitude], however, merely says that our sensations *are* like that: it states an empirical fact, and has no place in Kant’s apparatus of a priori principles. He provides no arguments for the impossibility of a world in which nothing is ever dim or in-between, in which there is only one level of pain, say, and only three degrees of saturation for each color.” *Kant’s Analytic*, 172. While Bennett is accurate in claiming that Kant does not consider such a possibility, one wonders whether he is not in fact begging the question against Kant when he charges him with failing to consider the possibility of a world with only discrete sensations, insofar as Bennett assumes a method of considering such cases which implicitly refers to *logical* possibility and impossibility. Since Kant is concerned with showing that there are transcendental as well as logical constraints upon possible experience, asking him to reject the merely logical conceivability of a world in which sensations do not possess continuous degrees is contrary to his project. Nevertheless, it is incumbent upon any defender of Kant’s thesis to come up with a plausible transcendental ground for this claim. As Bennett argues later in his discussion of Kant’s refutation of Mendelssohn’s proof of the immortality of the soul in the first *Paralogism*, one cannot conclude that the intensity is continuous merely on the basis of the continuity of time (178–180).

Gegenstandes auf die Vorstellungsfähigkeit, so fern wir von demselben affiziert werden” (A19–20/B34). While many commentators have focused on whether the object here is an empirical object or the thing in itself, another aspect of the definition is worth noting: Kant defines sensation with a term, *Wirkung*, that appears to be derived from an account of force and causation.¹⁰⁶ This definition, however, is problematic since cause and effect are, according to Kant, derived from the categories of relation. It thus seems premature to use them to explain the category of reality. Kant, at this point in the text, has not introduced the distinction between thing in itself and empirical object; nor has he argued for the categories as a priori concepts. Rather than trying to place his definition of sensation into the fully-developed framework of the *Critique*, perhaps it should be interpreted as an initial observation regarding the basic features of our experience: we distinguish between sensation and the object we sense and consider the former a product of the latter. This interpretation has the advantage of making the question of noumenal affection irrelevant for the passage, but it also suggests a basis for Kant’s claim that sensation has degrees: if sensation is defined as a *Wirkung*, as at least analogous in structure to our ordinary conception of force, then it is a feature of our very concept of sensation that it have a degree.¹⁰⁷ Kant’s claim in the Schematism that every sensation has a degree

¹⁰⁶ Longuenesse, as already mentioned, argues that “the most plausible way of interpreting the notion of ‘affection,’ in these initial paragraphs of the *Critique*, is to understand it as the affection of the representational capacities *by a thing in itself*.” She goes on to introduce an interesting distinction between types of sensation: “sensation as the original *affection* of sensibility by a thing in itself and as *apprehended* sensation.” *Kant and the Capacity to Judge*, 300. The latter would denote the sensation involved in the Schematism, while the former would be the type of sensation referred to in the Aesthetic. It is not obvious, however, why this distinction needs to be invoked to account for Kant’s definition in the Aesthetic.

¹⁰⁷ The entire question of noumenal affection can by no means be dispensed with so easily, but one is not required to resolve the conflict between epistemological and metaphysical readings

or magnitude is not, therefore, empirical in the sense of relying upon particular features of specific experiences; it merely requires that sensation be correlated with its object according to a *Wirkung*, once we understand this “effect” as capable of variation, like a force of particular degree.¹⁰⁸

The correlation between sensation and reality forms the basis of Kant’s account of the “kontinuierliche und gleichförmige Erzeugung” of reality within time in the final sentence; this is the synthesis performed by the schema of reality. Kant’s claim may be interpreted in two ways: according to the first reading, Kant asserts the thesis that all change is continuous. This thesis would hold that when sensation changes from one state to another over a period of time, it must pass continuously through all intermediate degrees. According to the second reading, Kant is not committed to the thesis of the continuity of change but only to the weaker claim that the possible degrees of sensation constitute a continuum. In this latter reading, Kant’s reference to the “kontinuierliche und gleichförmige Erzeugung” of reality in time does not indicate that a particular degree

of the thing in itself/object of experience distinction in order to account for Kant’s definition of sensation as affection by the object at A29/B34. Similarly, interpreting Kant’s definition in the Aesthetic as a statement of the basic framework according to which we explain the relation of the subject and object allows us to dispense with the concern that the categorial determination of causality cannot apply to the relation between sensation and the object.

¹⁰⁸ One might object that the analogy between the *Wirkung* of the object on sensation and force fails to hold for all the crucial characteristics. In particular, while orientation is an essential property of force, it is not immediately apparent that *Wirkungen* must be oriented. Indeed, if we examine many familiar sensations—color sensations, tastes, and sound perception, for instance—any such claim may sound implausible. If, however, this *Wirkung* does not demonstrate this essential property of force, then what would license us to conclude that *Wirkung* has any property of force on the basis of the analogy, beyond those characteristics that it is stipulated to have? The theory of realities Kant constructs in the 1763 essay on Negative Magnitudes states, however, that realities *do* have an orientation. This was, as we saw, one of the crucial features of his account, and there is no reason to think that Kant revised his opinion on this matter. Furthermore, Kant could respond to the above-mentioned examples by drawing a distinction between the *Wirkungen*, which must be oriented, and our resulting sensations of secondary qualities.

of sensation has been continuously generated over a specific period of time. Instead, it merely asserts that the act of synthesis generating a sensation with a specific magnitude could take on any possible value along a continuum. Although the first reading—according to which Kant asserts the continuity of change thesis—may seem more textually plausible, in the Anticipations, Kant explicitly denies that the continuity of change can be shown by transcendental philosophy (A171/B212–213).¹⁰⁹ Thus, it seems prudent to interpret Kant’s language in the Schematism as merely committing him to the weaker of the two claims. More specifically, from the thesis that sensation fills time to a greater or lesser degree, we can conclude that there is an *Übergang*—a possible continuum of degrees—from reality to negation that renders reality representable as a *quantum* (A143/B183). “Quantum” denotes a totality of a continuous magnitude. In the Anticipations, Kant distinguishes between *quanta* and aggregates: while the former are infinitely divisible unities, the latter are collections of discrete individuals (A170–171/B212). Kant attempts in the last clause of the sentence to explain what it means for

¹⁰⁹ Commentators vacillate between these two readings, often representing their position as claiming that Kant asserts the *possibility* of continuous change: namely, that for any given degree of sensation, we can imagine it as continuously generated over time. Paton equivocates between this formulation and the stronger thesis of the continuity of change. For instance, he asserts the latter claim when he writes: “... in passing from a paler to a darker shade, we must pass through all the intermediate shades.” *Kant’s Metaphysic of Experience*, 2:144. On the other hand, a few lines later he defends Kant against the claim of empirical psychology that sensations are discontinuous by merely asserting the weaker thesis: “but just as I know, when I see a line, that a shorter line is possible, so I seem to know, when I see a shade of colour, that a paler shade is possible” (2:145). Longuenesse first defends the view that sensation “can be represented as continuously generated through time.” She argues that this thesis is *weaker* than what I have called the continuity of sensation thesis according to which “sensation (and thus the real that ‘corresponds to it’) is a *quantum continuum*.” *Kant and the Capacity to Judge*, 314. She argues that Kant is not licensed to make this assertion and contrasts his endorsement of this thesis with his, in Longuenesse’s view, correct hesitation with regard to the continuity of change thesis. She ends by leaving the question open as to whether “the continuity of the real as an intensive magnitude (although not the continuity of change) can be asserted a priori, as a universal principle” (315).

reality to be posited as a quantum in time. This proceeds, Kant writes, “indem man von der Empfindung, die einen gewissen Grad hat, in der Zeit bis zum Verschwinden derselben hinabgeht, oder von der Negation zu der Größe derselben allmählich aufsteigt” (A143/B182). For the schema of reality to posit reality in time means that, at any given time, the degree of sensation could take any value on a continuum. The synthesis posits a continuum of potential degrees of fullness within an instant in time. The possibility of any degree of sensation along a continuum is thus correlated to the differing degrees of reality in an object, and both result from the “Synthesis der Empfindung (Wahrnehmung) mit der Vorstellung der Zeit, oder die Erfüllung der Zeit” (A145/B184). Kant’s formulation is instructive: he does not argue from the continuity of time to the continuity of intensive magnitude but instead that because inner sense can be affected to a particular, variable degree in a single instant, there must be a continuum of the amount of “fullness” of sensation in time. This amounts to a synthesis of sensation with the representation of time insofar as it posits an instant of time as the zero and claims that it could exist as filled by an amount of sensation. This interpretation of the schema of quality shows why Kant repeatedly insists in the Anticipations of Perception that the synthesis of “apprehension,” by which reality can be judged to have an intensive magnitude, “erfüllet nur einen Augenblick” (A167/B209). The emphasis here is on the verb “erfüllen”: the principle of intensive magnitudes states that reality *fills* or *saturates* a single instant, and the synthesis of apprehension is that which posits this instant as filled to a particular degree. The synthesis conditions a feature of experience and is thus a pure, transcendental synthesis constituting experience.

The account of temporal determination Kant develops from his pre-Critical writings to the Schematism underlies the different arguments he introduces in the Anticipations. We can now answer the question posed at the outset of how we can determine something a priori regarding the matter of experience. The question can be reformulated: if matter is already the result of a transcendental synthesis by which it is posited as filling an instant of time, what becomes of givenness? According to Kant, everything we experience, whether through inner or outer sense, is already “formed”—sensibility itself involves a presentation of objects in time and space. There is thus no question for Kant of our awareness of directly given, unformed sensations. Every sensation we experience must already have been synthesized, posited as taking place within time, and thus as filling the instant to a particular degree and falling under the categories of quality. The instantaneous synthesis of apprehension is simply the condition for the reality we perceive to have a degree. However, it does not exhaust the content of sensation but merely places it in relation to time as filling the instant to a degree. The problem which does remain, however, lies in Kant’s proof for the principle. As we have seen in the analysis of the Schematism, Kant relies at a crucial juncture upon the continuity of sensation conceived of as a *Wirkung* with a degree. There is thus an implicit reliance upon the gradations of force in his account, but Kant never mentions this force in the arguments he provides in the Anticipations, perhaps because this would require him to explain the nature of the *Wirkung* by which sensation is produced.¹¹⁰ To see this, we

¹¹⁰ The one instance in which Kant approaches this connection is in relation to his definition of “Moment,” cited earlier (A171/B212–213). His doctrine of force is also implicit in his discussion of the dynamical theory of matter at A173/B215–A175/B216.

will briefly outline the structure of the Anticipations, attempting to use his exposition of the schema of reality in order to interpret Kant's formulations.

Kant's discussion in the Anticipations has several discrete sections, and commentators tend to divide it into two or three proofs plus several expository sections.¹¹¹ In the first paragraph of the A edition, Kant defines "Anticipation" as "alle Erkenntnis, wodurch ich dasjenige, was zur empirischen Erkenntnis gehört, a priori erkennen und bestimmen kann" (A166/B208) and justifies the use of this term for a principle that determines an a priori principle for what "den eigentlichen Unterschied des Empirischen von dem Erkenntnis a priori ausmacht, nämlich die Empfindung (als Materie der Wahrnehmung)" (A167/B209). Kant therefore begins by emphasizing the peculiarity of a principle governing the matter of perceptions. This strangeness, he writes, justifies reserving the name "anticipation" for this principle:

¹¹¹ Kemp Smith's summary of the contents is useful here: "The first paragraph [of the first edition] explains the term "anticipation." The second and third paragraphs give a first proof of the principle. Paragraphs four to ten treat of continuity in space, time and change, and of the impossibility of empty space, and also afford Kant the opportunity to develop his dynamical theory of matter, and so to indicate the contribution which transcendental philosophy is able to make towards a more adequate understanding of the principles of physical science. The eleventh and twelfth paragraphs, evidently later interpolations, give a second proof of the principle which in one important respect varies from the first proof. In the second edition a third proof, akin to this second proof, but carrying it a stage further, is added in the form of a new first paragraph." *Commentary*, 349. (Kant does not argue, however, that empty space is "impossible," but only that one can never prove from experience that there is an empty space.) The crucial difference, according to Kemp Smith, between the first and second versions of the proof is that in the first, Kant does not include any synthesis, whereas in the second, he speaks of "some species of synthesis." Kemp Smith is not at all persuaded that any of the versions of the proof succeeds. He writes: "Thus Kant's thesis, that the apprehension of sense qualities as intensive magnitudes presupposes a synthesis according to an a priori schema, is both obscure in statement and unconvincing in argument" (352). Kemp Smith, however, interprets the two latter proofs as "inspired by the desire to make all apprehension, even that of simple sensation, a temporal process, and by that indirect means to establish for sensuous intensity and its objective condition a continuity similar to that of space and time" (353). I will argue against this reading in what follows.

Gesetzt aber, es finde sich doch etwas, was sich an jeder Empfindung, als Empfindung überhaupt (ohne daß eine besondere gegeben sein mag,) a priori erkennen läßt; so würde dieses im ausnehmenden Verstande Antizipation genannt zu werden verdienen, weil es befremdlich scheint, der Erfahrung in demjenigen vorzugreifen, was gerade die Materie derselben angeht, die man nur aus ihr schöpfen kann. Und so verhält es sich hier wirklich. (A167/B209).

Kant's statement here makes sense against the backdrop of his discussion of the schema of reality, for there he explains that sensation *as such* has a degree or magnitude. This feature of sensation is absolutely general and results from a pure synthesis positing sensation as filling time to a certain degree.

The second paragraph begins with Kant's statement that apprehension "erfüllet nur einen Augenblick." Kant defines an "Augenblick" as something that can be filled or empty. From this, Kant concludes that it cannot have extensive magnitude, since this involves successive synthesis and then remarks that the lack of sensation "in demselben Augenblicke" would be enough to justify representing the instant as empty.¹¹² Next, Kant reiterates the claim from the Schematism that reality in empirical intuition corresponds to sensation, and negation to the lack of sensation, before invoking the claim established in the Schematism that any sensation can be diminished: "Nun ist aber jede Empfindung einer Verringerung fähig, so daß sie abnehmen, und so allmählich verschwinden kann" (A168/B210). From the premises, first, that there is a complete correlation between reality and sensation, and, second, that sensation is continuous, he concludes that there is

¹¹² One might object to this that the apprehension of extended spatial magnitudes does not seem to involve a successive synthesis when these magnitudes can be seen in a single glance. This, however, would confuse the synthesis that is a condition for the apprehension of extensive magnitudes with the empirical synthesis that takes place when we look at objects too big to be apprehended in an instant. Even in the case of sufficiently small objects, merely apprehending them as in space requires us to apply the schema of quantity, which involves positing the object within a homogenous space and at a single instant, and thus requires an a priori successive synthesis.

a continuum between reality and negation. In the last sentence of the paragraph, he announces the result that the real in appearances has a magnitude: “welche aber nicht in der Apprehension angetroffen wird, indem diese vermittelt der bloßen Empfindung in einem Augenblicke und nicht durch sukzessive Synthesis vieler Empfindungen geschieht, und also nicht von den Teilen zum Ganzen geht; es hat also zwar eine Größe, aber keine extensive” (A168/B210). As Kant points out in the next paragraph, a magnitude that is apprehended as a unity must be intensive. The sentence just cited emphasizes another aspect of Kant’s account: even though the magnitude of sensation is the product of a synthesis and this synthesis posits it as filling an instant of time to a particular degree, we cannot encounter this magnitude within apprehension, because it occurs in a single *Augenblick*. An instant is not simple; a degree can be present within it, and thus it can already require a synthesis according to the schema of reality, but this cannot itself be made the object of our awareness, because anything we are aware of must be thought of as occurring over time. In so far as time is a continuum, instants are merely the borders or limits, rather than the components of time, as Kant argues on the following page. This reveals the basic tension within Kant’s account of intensive magnitudes: he relies upon a theory of an instant as “filled” to a particular degree, but this model of the instant as “containing” a reality is in conflict with the essentially continuous nature of time, which does not, for Kant, admit of distinct, positively given atomic parts.

In paragraphs three and four, Kant adduces several corollaries from this principle: he defines the “moment” as a causal relation between a reality and either another reality or a sensation (thus connecting the temporal and the causal), and then again asserts that

both realities and perceptions—for instance, colors, warmth, weight, etc.—all have intensive magnitude. These examples encompass all the qualitative properties of phenomena, along with subjective feelings and states. The two kinds of properties submit to the same sort of analysis, because of the correlation between sensation and reality. Paragraph five considers continuity and makes the aforementioned point that “Punkte und Augenblicke sind nur Grenzen, d. i. bloße Stellen ihrer Einschränkung” (A169/B210). Though Kant’s account of continuity mirrors Leibniz’s theories—including, of course, the claim that instants are merely limitations and not the constituents of the temporal continuum—the statement has a particular importance in the present context, because of the difficulty just mentioned: how can mere limits themselves “contain” a degree, the result of a synthesis? One possible answer might start from Kant’s distinction between *Grenzen* and *Schranken*: since the former have a positive existence, perhaps they can be filled by degrees of reality, resulting from the counter-positing of reality and negation. Kant, however, does not address this question in the Anticipations, but waits until the *Kritik der Urteilskraft* to develop a theory of limitation in relation to time and forces. In the Anticipations, he simply concludes from his definition of continuity that “All Erscheinungen überhaupt sind demnach kontinuierliche Größen, sowohl ihrer Anschauung nach, als extensive, oder der bloßen Wahrnehmung (Empfindung und mithin Realität) nach, als intensive Größen” (A171/B212), before contrasting the discontinuous aggregate to the continuous quantum.¹¹³ As has been

¹¹³ The example Kant uses to illustrate this distinction is particularly perspicuous. When synthesis stops and is merely repeated, discontinuously, Kant says an aggregate results. “Wenn ich 13 Taler ein Geldquantum nenne, so benenne ich es so fern richtig, als ich darunter den Gehalt von einer Mark fein Silber verstehe; welche aber allerdings eine kontinuierliche Größe ist, in

mentioned before, Kant hastens to add to this the disclaimer in the seventh paragraph that the continuity of *change* cannot be proven from the continuity of extensive and intensive magnitudes, because “die Kausalität einer Veränderung überhaupt ganz außerhalb den Grenzen einer Transzendental-Philosophie läge, und empirische Prinzipien voraussetzte” (A171/B213). In particular, Kant cites the concept of a cause that can change the state of a thing to its opposite and claims we have no grounds for asserting a priori that anything falls under that concept.¹¹⁴

Next, Kant presents evidence for the fruitfulness of the principle of intensive magnitudes by considering several frequently debated claims in physics: the question of the possibility of empty space and the related application of this principle in accounting for the density of matter. These paragraphs suggest most directly the connection between

welcher kein Teil der kleinste ist, sondern jeder Teil ein Geldstück ausmachen könnte, *welches* immer Materie zu noch kleineren enthielte. Wenn ich aber unter jener Benennung 13 runde Taler verstehe, als so viel Münzen (ihr Silbergehalt mag sein, welcher er wolle,) so benenne ich es unschicklich durch ein Quantum von Talern, sondern muß es ein Aggregat, d.i. eine Zahl Geldstücke, nennen. Da nun bei aller Zahl doch Einheit zum Grunde liegen muß, so ist die Erscheinung als Einheit ein Quantum, und als ein solches jederzeit ein Kontinuum” (A170–171/B212). The continuity of all appearances is thus one of the structuring principles of sensibility for Kant.

¹¹⁴ It would be productive to analyze this passage more closely in connection with Kant’s arguments for the principle of causality in the Analogies. In particular, it might seem that the second Analogy provides just such a principle in declaring that “Alle Veränderungen geschehen nach dem Gesetze der Verknüpfung der Ursache und Wirkung,” (A189/B232). Besides the structural reason for Kant’s assertion in the Anticipations—namely, that at this point in the argument there is no basis for asserting a principle of causality a priori, since this would depend upon the categories of relation—Kant claims in this passage that the possibility of such a cause cannot be established because “die Veränderlichkeit nur gewisse Bestimmungen der Erscheinungen trifft, welche die Erfahrung allein lehren kann, indessen daß ihr Ursache in dem Unveränderlichen anzutreffen ist” (A171/B213). Any adequate consideration of this claim would thus have to look at it in relation to all three of the Analogies, which concern the relationship between the changeable and the unchangeable. In the present context, however, the important point is merely that not only does Kant *not* invoke the continuity of change as any sort of *explanation* for the principle of intensive magnitude, but he does not even think that the continuity of change can be derived *from* the principle of intensive magnitudes.

Kant's principles and his dynamical theory of matter, and, as already mentioned, many commentators view the foundation of this theory as Kant's central aim in the Anticipations. We have already examined the connection between Kant's dynamical theory of matter and the principle of intensity in the section on Kant's theory of force, and only one additional point needs to be made concerning these paragraphs: Kant's argument for the imperceptibility of empty space or time relies upon an account of thresholds for each of the senses.¹¹⁵

Wenn alle Realität in der Wahrnehmung einen Grad hat, zwischen dem und der Negation eine unendliche Stufenfolge immer minderer Grade stattfindet, und gleichwohl ein jeder Sinn einen bestimmten Grad der Rezeptivität der Empfindungen haben muß; so ist keine Wahrnehmung, mithin auch keine Erfahrung möglich, die einen gänzlichen Mangel alles Realen in der Erscheinung, es sei unmittelbar oder mittelbar ... bewiese, d.i. es kann aus der Erfahrung niemals ein Beweis vom leeren Raume oder einer leeren Zeit gezogen werden. (A172/B214)

Kant claims here that although reality is continuous, it is an empirical fact that each sense has a “determinate degree of receptivity for sensations”—it has a “threshold” constituting the minimum degree of perceptibility. In other words, there is a disanalogy between what we discern—which is discontinuous because it relies upon this minimum of receptivity—and the degree of reality and sensation, which is continuous. As already mentioned, later commentators have accused Kant of ignoring the possibility of a minimum threshold for

¹¹⁵ Robert Paul Wolff makes this point with reference to the *Metaphysical Foundations of Natural Science*: “Kant does not believe in the existence of a void, but he contents himself in the *Metaphysical Foundations* with a proof that the void is undemonstrable. The argument is that we can at least conceive of a space filled through and through with matter of such low density that its force falls below the minimum required to affect our sense organs or instruments of measurement. This being the case, when we encounter a volume of space which presents no appearance to us, we can never know whether it is a void or merely an excessively rarefied matter. Kant uses this argument in the Anticipations, as we shall see.” *Kant's Theory of Mental Activity*, 233. (As far as I can see, however, Wolff does not return to this point in his discussion of the Anticipations).

sensation and have taken this minimum threshold as a decisive objection to Kant's claim that sensation is continuous. Since it is evident from this passage that Kant maintains that there are actually thresholds of perception, we must see whether such a view is in fact compatible with his claim for the continuity of sensation. Earlier, we suggested that this might be the case because nothing in Kant's view commits him to the belief that we must, in Jonathan Bennett's terminology, be able to "notice" increasingly tiny differences in sensation. Even though the difference between a particularly tiny degree of reality and zero might be imperceptible, this does not mean the sensation is discontinuous but merely that the transitions of sensation are not all available to the conscious subject. Here, the analogy to time clarifies the point: we cannot, after all, perceive minute changes in time, but we would never claim that time must be discontinuous because of this. Although this could seem disanalogous, because time, unlike sensation, might be considered to be completely independent of the subject, this objection does not hold for Kant. Just as the form of time conditions all of experience, so the continuum of sensation governs our ability to have perceptions of varying intensity. The ability consciously to distinguish minute gradations is no more relevant in the one than in the other case.

The final two paragraphs of the Anticipations form what Norman Kemp Smith calls the "second proof" of the Anticipations. Paragraph eleven, however, begins not with a proof but with another comment regarding the peculiarity of the principle. Kant remarks: "es ist also doch eine der Auflösung nicht unwürdige Frage: wie der Verstand hierin synthetisch über Erscheinungen a priori aussprechen, und diese so gar in demjenigen, was eigentlich und bloß empirisch ist, nämlich die Empfindung angeht,

antizipieren könne” (A175/B217). This question mirrors that proposed at the beginning of the section; his answer, however, is cast in slightly different terms.¹¹⁶ First, Kant distinguishes between the quality of sensation, which is merely empirical, and the real that corresponds to the sensation. The real that is opposed to negation “*stellet nur etwas vor, dessen Begriff an sich ein Sein enthält, und bedeutet nichts als die Synthesis in einem empirischen Bewußtsein überhaupt*” (A175/B217). The first part of this definition reiterates the explanation of reality from the Schematism, while the second part summarizes Kant’s account of the schema of reality. The phrase “*die Synthesis in einem empirischen Bewußtsein überhaupt*” shows that the nature of the synthesis of reality is to place any sensation along a scale of other, possible sensations and thus to posit the real corresponding to it as occupying a particular point along the *very same* continuum as all other instances of realities. Kant thus writes “*in einem empirischen Bewußtsein überhaupt*” to indicate that the synthesis underlying the principle of intensive magnitudes is required for all of our perceptions to be unified in a *single* consciousness by being posited along a continuum.¹¹⁷

¹¹⁶ Kemp Smith regards the second proof as deviating significantly from the first in introducing a transcendental synthesis underlying the principle of intensities. As our consideration of the Schematism and of the Anticipations has shown, however, this synthesis is a feature of Kant’s account throughout. *Commentary*, 352.

¹¹⁷ The following sentence states that the amount of sensation produced by an intuition of a certain extensive magnitude can be made equal to an aggregate of several other intuitions of the same extensive magnitude but of a lesser degree of intensity; the example he uses is that of the degrees of brightness of a plane surface. Kant makes the point even more forcefully in his summary of the Anticipations in the following section when he writes: “*So werde ich z. B. den Grad der Empfindungen des Sonnenlichts aus etwas 200 000 Erleuchtungen durch den Mond zusammensetzen und a priori bestimmt geben, d. i. konstruieren können*” (A178/B221). Wolff attacks Kant’s statement of the equivalence for being both implausible and for confusing the distinction between the synthesis of extensive and intensive magnitudes: “if such a synthesis actually occurs—if we put together 200,000 moon-illuminations to form sunlight—then the representation of the former precedes and makes possible the representation of the latter. By

The aspect of the Anticipations to which commentators have reacted with most perplexity, Kant's account of an instantaneous synthesis, is, we have seen, far from an obscure, patchwork invention, constructed solely in the attempt to integrate the principle of intensive magnitudes into the Critical framework. Instead, it is an essential feature of Kant's account of temporal determination, established in the Schematism and stretching back to his theories of real opposition in his 1763 essay on negative magnitudes. The difficulties with this synthesis do not stem from the familiar complaint that we cannot imagine a synthesis that would be instantaneous. As we have seen, this synthesis conditions and generates our temporal experience; it cannot be perceived within time and does not occur over time. A difficulty, however, remains: Kant must provide a theory of *Augenblicke* and *Momente* not as components of a continuum but as limits. Interpreting the "instantaneous synthesis" not as occurring *at* an instant within time but as the pre-temporal condition for perception avoids the charge that any synthesis must be temporally extended, but it does not solve the problem of conceiving of the limits of time as capable of being filled with reality. For instants to be limits and not positive parts implies that they cannot be strictly understood on the model of a container for reality, as Kant's terminology might suggest. Instead, limits themselves are determined in accordance with particular degrees of reality—these degrees are not their "contents" but the modes in

Kant's definition, then [B 203], sunlight would have *extensive* magnitude." *Kant's Theory of Mental Activity*, 236. While Wolff is correct in characterizing the synthesis of the moon-illuminations into sunlight as extensive, since the parts would precede the whole, this is not the synthesis that Kant says occurs in applying the concept of reality. Instead, the illumination of the sun is given first, and the synthesis takes place when we consider it as something that could be diminished or increased. By placing it along this scale, we allow for the possibility of an extensive synthesis from parts to whole—via the composition of moon-illuminations, for instance—but this would be a secondary, possible empirical synthesis and merely a corollary of the application of the schema of reality.

which they are given to us. This account emerges from considering the role of the transcendental synthesis of the imagination in applying the categories of reality and is further strengthened by analyzing the Anticipations. Kant develops these views in reassessing his theory of temporality in the third *Critique*. In 1790, as we will see, Kant revises his theory of temporal determination, limitation, and force in the section on the sublime in the *Kritik der Urteilskraft*.

Chapter 4:

The Dialectic of Intensity: Infinite Judgment in the “Analytic of the Sublime”

In his theory of aesthetic magnitude in the Analytic of the Sublime in the *Kritik der Urteilkraft* (1790), Kant returns to the central, unsolved question of the Anticipations: are instants (*Augenblicke*) the simple constituents of temporal sequences or are they capable of containing a multiplicity? Kant appears to make both claims in the first *Critique*. He seems to declare the simplicity of instants of time in the first edition of the Transcendental Deduction: “denn als in einem Augenblick enthalten, kann jede Vorstellung niemals etwas anderes, als absolute Einheit sein” (A99).¹ This brief remark occurs in a section describing the three syntheses—apprehension in an intuition, reproduction in imagination, and recognition in a concept—that are necessary for all cognition of objects. In arguing for the decisive thesis that the temporal sequence is required for the representation of multiplicity and, on this basis, that cognition of an object always involves a synthesis of apprehension in an intuition, Kant relies upon the claim that instants only contain “absolutely unified” representations.² In the Anticipations, on the

¹ Rudolf Makkreel discusses this apparent contradiction in his book, *Imagination and Interpretation in Kant: The Hermeneutical Import of the Critique of Judgment* (Chicago: University of Chicago Press, 1990), 74–77. H. J. de Vleeschauwer notes that Kant’s description of the *Vorstellung* as absolutely simple implies that “l’impression n’est pas une grandeur extensive, mais intensive.” *La déduction transcendentale dans l’oeuvre de Kant* (Antwerp: de Sikkel, 1936), 2:243. While it is true that intensive magnitudes are unities that only contain the many implicitly, even this implicit containment of the many would seem to make them incompatible with the absolute unity of representations given in an instant. Moreover, Kant’s description of the instant as the limit of a temporal sequence in the Anticipations does not accord with the composition of temporal continuity out of discrete instants, which appears to be required by Kant’s claim that there are absolutely unified representations given in an instant.

² Sacha Golob calls this view “perceptual atomism” in his “Kant on Intentionality, Magnitude, and the Unity of Perception” (forthcoming in the *European Journal of Philosophy*). As Golob remarks, Kant’s arguments against the “naive view of time-determination” (5) in the

other hand, Kant admits that the principle of intensity requires that the reality perceived in a single instant be capable of variation and thus implicitly contain a multiplicity. The passage at A99 appears to exclude this by saying that a single moment can only contain an absolutely simple representation. A99 also seems to be incompatible with Kant's claim that instants are not elements of the temporal sequence (*Folge*), since how can a limit of a sequence "contain" a representation at all, whether single or multiple? These different strands of Kant's account of time in the first *Critique* can be reconciled if Kant is not asserting that we are given individual moments that contain simple representations. Instead, his point is that since we can distinguish the multiplicity in any intuition, we must always possess more than one intuition. In the third *Critique*, I will argue, he goes beyond this negative account of temporal constitution and provides a new theory of the instant (*Augenblick*) as a felt limit to temporal synthesis that generates the ideas of reason.³ When he returns to the question of the simplicity of the instant in 1790, he examines a limitation of figurative synthesis itself: the upper bound encountered in the synthesis of the many into a single whole, presentable within an instant. He argues that there is a

Analogies—as well as his claim that I “cannot represent any line, no matter how small, without drawing it in thought, i.e. successively generating all the parts from one point” (A162/B203)—seem to rely on this view. Golob notes, however, that even independent of the conflicting textual evidence for perceptual atomism, it is implausible as an account of perceptual experience. See also Lewis White Beck, *Essays on Kant and Hume* (New Haven: Yale University Press, 1978), 144, and James van Cleve, *Problems from Kant* (Oxford: Oxford University Press, 1999), 86, for versions of this objection. Golob argues that, on closer examination, it is illegitimate to attribute perceptual atomism to Kant, because the unities out of which successive perception is composed are not simples but instead the *Grundmaß*—a unity that is itself produced by synthesis. Like Golob, I think any resolution of the problem of perceptual atomism depends upon a reading of the *Grundmaß*, although the details of the account he provides differ from my own.

³ For a penetrating analysis of temporality in the first and third *Critiques*, from which I have profited immensely, see Werner Hamacher, “Ex tempore: Zeit als Vorstellung bei Kant,” in Joachim Gerstmeier and Nikolaus Müller-Schöll, eds., *Politik der Vorstellung: Theater und Theorie* (Berlin: Verlag Theater der Zeit, 2006), 68–94.

necessary possibility of the failure of this *synthesis speciosa* and this very failure to represent an infinite given whole awakens the idea of totality. This possibility of failure in fact awakens the feeling of the limits of the imagination, and the judgment regarding this failure is *infinite*. In the following chapter, I will attempt to reconstruct Kant's theory of the sublime as ultimately resting upon his account of infinite judgment, and, in particular, a form of reflective infinite judgment.

He develops this theory of the *Augenblick* in the context of his general task in the *Kritik der Urteilkraft*: to provide an account of the relationship between the a priori theoretical principles of cognition established in the *Kritik der reinen Vernunft* and the laws of freedom set out in the *Kritik der praktischen Vernunft*. In the Introduction to the third *Critique*, Kant claims that philosophy can be divided into two domains, the first of nature and the second of freedom (Ak. 5:171–176). The faculty of the understanding legislates in the domain of nature, while reason provides the principles of freedom. In the third *Critique*, however, Kant claims that the third faculty—judgment—also contains a priori principles. Although there is no independent “domain” over which judgment legislates, it nevertheless is an “a priori gesetzgebenden Vermögen” and thus is subject to critique. According to Kant, there are two types of judgment, determinative judgments, in which the general principle is given and the particular must be subsumed under it, and reflective judgments, for which the particular is given and the general must be sought (Ak. 5:179). Only the reflective power of judging requires its own transcendental principle, so the project of the third *Critique* is to find the a priori principle of reflective judgment. According to Kant, this principle consists in the “purposiveness of nature” (Ak. 5:180),

and this purposiveness can be considered either “subjectively” or “objectively.” The subjective purposiveness of nature, Kant claims, is “formal” and can be found in aesthetic pleasure, while the objective purposiveness of nature provides the principles of teleological judgments. The section on the sublime, the focus of this chapter, concerns a type of reflective, singular judgment that is coupled with a feeling of pleasure.

While in the first *Critique* Kant argues that a *synthesis speciosa* grounds the possibility of forming determinative judgments yielding cognition regarding the sensible world, in the third, he demonstrates that another form of judgment—concerned not with determinations but with reflections upon the activity of judgment—also must be possible for cognition to occur. He investigates the relationship between feeling and reason that takes place in a particular form of “aesthetic reflection,” an act in which the different faculties not only consider their own workings but also take pleasure in this “transcendental topic.”⁴ The sublime thus shares the task of transcendental topology with the Amphiboly of the Concepts of Reflexion (A260/B316–A292/B348) but differs from the Amphiboly in positing an a priori connection between the activity of transcendental reflection and a kind of feeling. Specifically, Kant is concerned with a type of reflective judgment that bears an a priori connection to the feeling of pleasure (*KdU*, Introduction, Ak. 4:191). In the case of the sublime, the feeling of pleasure stems from a judgment

⁴ This characterization is indebted to the framework Peter Fenves establishes in his essay, “Taking Stock of the Kantian Sublime,” *Eighteenth-Century Studies* 28 (1994): 65–82. Fenves takes Frederick Beiser’s claim that the dangers within Kant’s philosophy inexorably lead to a revival of metaphysics as the starting point of his discussion. See Frederick Beiser, *The Fate of Reason* (Cambridge: Harvard University Press, 1987), 326. Fenves interprets Kant’s *Analytik des Erhabenen* through the question of whether another relation between reason and sensibility is possible. Fenves analyzes four recent expositions of the sublime in order to consider the aspects of the sublime that “give[] an impetus to renewed metaphysical speculation” and those tendencies that “run[] counter to this very same impulse” (“Taking Stock,” 66).

regarding the subjective purposiveness of reason itself. This judgment, however, arises because of a difficulty inherent in the activity of temporal synthesis. Although the focus of Kant's account seems to be on particular kinds of objects—of tremendous size or power—the sublime in fact stems from a possibility implicit in all instances of temporal synthesis and results in the awakening of a feeling of the limits of the imagination.⁵

Indeed, the problem of the temporal instant—the *Augenblick* or *Moment*—leads Kant to introduce an idea of totality belonging not to intuition, imagination, or the understanding, but to reason. This idea of totality is one of an infinite sphere that borders upon the domain of that which is presentable. It is thus an idea of an infinite totality, and this infinite totality can only be presented in an infinite judgment. This description of

⁵ Paul Crowther argues that Kant's account of the sublime in fact comprises two separate models: one, a "Baroque-thesis [*sic*] about vast objects leading us to search out infinity in order to provide a measure for the estimation of their magnitude," the second a "minor, more austere account which arrives at the sublime through imagination's inadequacy to satisfy reason's idea of the object as a whole." *The Kantian Sublime: From Morality to Art* (Oxford: Clarendon Press, 1989), 104. While Crowther disapproves of the "Baroque" thesis, calling it "phenomenologically counter-intuitive and philosophically superfluous," he views the "more austere" claim as philosophically salvageable (104). Crowther's provocative account of these two argumentative strands in the *Analytic of the Sublime* has occasioned many responses, among them Henry Allison's defense of the unity and coherence of Kant's argument in his chapter on the sublime in *Kant's Theory of Taste* (Cambridge: Cambridge University Press, 2001). Allison writes that "[i]f we take seriously the initial conception of the mathematically sublime as the absolutely great ... the reference to infinity is clearly essential to the Kantian account, for reason's demand on the imagination follows directly from the latter's endeavor to provide an intuitive representation of something fitting that description" (397, fn. 22). As Crowther points out in his recent response to Allison in *The Kantian Aesthetic: From Knowledge to the Avant-Garde* (Oxford: Oxford University Press, 2010), 181–183 fn. 10, it is unclear in what sense reason's demand is supposed to "directly follow" from the imagination's attempt to represent infinity. In my view, there is a more fundamental worry concerning the reference to infinity in the mathematical sublime—namely, it does not seem as though judgments of the sublime are provoked by actually infinite objects but are occasioned by an attempt to represent objects that in some way cause the imagination to feel itself placed under a demand that it cannot satisfy. The infinity thus pertains to the demand of reason, rather than to the object. This qualification provides, however, a hint at a reading that would reconcile the "Baroque" with the "austere" tendencies in Kant's work, for it indicates that the "infinity" Kant speaks of refers *not* to a feature of objects or magnitudes but to a type of judgment. I will present this reading in the third section of the chapter.

temporal synthesis also contains a theory of intensive magnitudes, for it concerns the problem of how the one can implicitly contain the many. The *Analytic of the Sublime*, I will argue, proposes a revision to the first *Critique's* theory of intensive magnitudes, suggesting an account in which the insufficient unity of the *Augenblick* calls forth the idea of a totality that exceeds the bounds of the sensible.

Kant does not make explicit the connection between the sublime and intensive magnitude, instead introducing a series of concepts that are linked to intensity but do not directly invoke it. In fact, the connection between these concepts and Kant's theory of intensity has been all but ignored in the secondary literature.⁶ In order to show this connection, I will begin by analyzing four main elements in Kant's theory of the sublime: his concept of aesthetic magnitude (§1), his brief description of apprehension and comprehension along with his account of temporal determination (§2), his revision of the theory of limitation, and his new account of the negative presentation of the idea of totality (§3). These three aspects of the theory of the sublime present what I will call a "dialectic of intensity," a theory of the necessary possibility of a failure to present the many through the one and the awakening of the idea of a totality. Kant's discussion of the negative presentation of the idea of totality represents a dialectic within the "Analytic

⁶ Makkreel is a prominent exception to this, but even his discussion provides a merely cursory examination of the link between the Anticipations and the sublime, when he considers the question of whether the imagination alone can grasp a multiplicity of objects in space. *Imagination and Interpretation in Kant*, 72. In her recent article, "Intensive Magnitudes and the Normativity of Taste," in Rebecca Kukla, ed., *Aesthetics and Cognition in Kant's Critical Philosophy* (Cambridge: Cambridge University Press, 2006), 138–161, Melissa Zinkin argues that intensities play an important role in the third *Critique* but locates their function in the aesthetic ideal. In my view, however, Kant's theory of aesthetic magnitude and temporal determination in the *Analytic of the Sublime* is much more closely connected to the Anticipations.

of the Sublime” and suggests a role for the ideas of reason within the very activity of temporal determination.

1. Aesthetic Magnitude: *Quantitas* and *Magnitudo*

The topic of the *Analytik der Erhabenen* is magnitude, but a kind of magnitude distinct from that in judgments of quantity. In the *Grundsätze* in the first *Critique*, Kant describes judgments of quantity as determinations of how much there is of something. To make these judgments, the understanding must successively combine units and assign a determinate measure to an object with respect to the unit chosen.⁷ But Kant introduces a new type of magnitude in the “Namenerklärung des Erhabenen,” which forms the first part of the section on the mathematical sublime: “*Erhaben* nennen wir das, was *schlechthin groß* ist. *Groß* sein aber und eine *Größe* sein sind ganz verschiedene Begriffe (*magnitudo* und *quantitas*)” (*KdU*, §25, Ak. 4:248). Despite its occurrence in the section on the mathematical sublime, this definition encompasses the dynamic sublime as well. In fact, there is a particularly close connection between the dynamic sublime and intensive magnitudes. In his brief discussion of the sublime in §68 of the *Anthropology*, Kant

⁷ The principle of the Axioms of Intuition states that “Alle *Anschauungen* sind extensive Größen” (A162/B201). He defines an extensive magnitude, in contrast to an intensive magnitude, as one in which “die Vorstellung der Teile die Vorstellung des Ganzen möglich macht” and remarks that since mere intuition is always spatiotemporal, each intuition has an extensive magnitude that can be cognized through a “sukzessive Synthesis (von Teil zu Teil) in der Apprehension” (A163/B204). This successive synthesis, Kant continues, grounds geometry, “die Mathematik der Ausdehnung.” The axioms of geometry express the conditions of outer sensible intuition. Kant introduces here a distinction between *quanta* and *quantitas*: *quanta* are the continuous magnitudes themselves, whereas *quantitas* is the determinate magnitude that answers the question “wie groß etwas sei?” (A163–164/B204). Only “Größen (*quanta*) als solche” have axioms, synthetic a priori principles that ground their possibility. The axioms of *quanta*, as well as the successive synthesis of the imagination, are sufficient for the application of mathematics to the objects of experience and thus to secure the a priori applicability of *quantitas* to phenomena (A165/B205). In the *Analytic of the Sublime*, Kant contrasts *magnitudo* to *quantitas* in this sense.

describes the magnitude of the sublime: “Das Erhabene (*sublime*) ist die ehrfurchterregende Großheit (*magnitudo reverendo*) dem Umfange oder dem Grade nach ...” (Ak. 7:243). Although Kant never uses the term “intensive magnitude” in his description of the excitation of fear required for the dynamical sublime, he writes: “Denn in der ästhetischen Beurteilung (ohne Begriff) kann die Überlegenheit über Hindernisse nur nach der Größe des Widerstandes beurteilt werden” (*KdU*, §28, Ak. 5:260). The magnitude of resistance is a force that can be judged *aesthetically*, that is, by the activity of the subject’s imagination. Two paragraphs later, Kant explains our tendency to call cliffs, threatening clouds, and volcanoes sublime because “sie die Seelenstärke über ihr gewöhnliches Mittelmaß erhöhen und ein Vermögen zu widerstehen von ganz anderer Art in uns entdecken lassen, welches uns Mut macht, uns mit der scheinbaren Allgewalt der Natur messen zu können” (Ak. 5:261). The dynamic sublime arises through a particular kind of measurement: the magnitude of the soul is raised above its customary degree or intensity, and this provides us with the courage to measure ourselves against something that seems to be *all*-powerful. Nature’s *Gewalt* appears to be total—*All*—because it seems that nothing *within* nature can resist the power of the entirety of nature. But in so far as particularly violent manifestations of nature’s power alert us to a *Vermögen* that would be of an utterly different kind—a capacity that would stand apart from nature—nature’s power is revealed to be incomplete. There is a capacity within us that is not subsumed under this *All*. In the dynamic sublime, the intensity of nature’s power raises the degree of our soul’s own state, thereby awakening a different kind of power to

resist, a capacity that in turn shows that the totality of nature's power is incomplete—it is not “absolute.”

Kant's new account of measurement in the *Analytic of the Sublime* confronts, however, a version of Leibniz's puzzle concerning unity and multiplicity. This form of measurement is supposed to be “absolute,” but since there are no simples in time and space, there can be no measurement based on an absolute either. This leads Leibniz, as we have seen in Chapter One, to formulate a doctrine of simple substances with particular degrees of force and to ground the reality of extended substances in these non-extended simples. In his discussion of this problem in the Amphiboly of the first *Critique*, Kant rejects Leibniz's argument for simple substances as involving a misapplication of a concept of the understanding to objects given in sensibility.⁸ Although Leibniz's account of simples falls prey to a mistake in transcendental topology, Kant likewise does not succeed in banishing the problem for good. It returns in his 1790 treatment of the relations among the faculties. In his discussion of the sublime, Kant maintains the limitations placed on the faculties in their cognitive use. Leibniz's argument does not convince Kant of the need to posit metaphysically absolute unities: Kant appeals to an “absolute measure” of another sort. Although the objects given in sensibility cannot possess absolute objective measures because the understanding can only determine magnitudes relatively, they can have “subjective measures” that we apprehend immediately in intuition (*KdU*,

⁸ The section on the sublime is closely tied to the Amphiboly. In the first *Critique*, Kant defines *reflection* as “der Zustand des Gemüts, in welchem wir uns zuerst dazu anschicken, um die subjektiven Bedingungen ausfindig zu machen, unter denen wir zu Begriffen gelangen können” (A260/B316). Each of the concepts he introduces there is a *conceptus comparationis*, whose conditions of application require “die Unterscheidung der Erkenntnisart, wozu sie gehören” through transcendental reflection.

§26, Ak. 5:251). Thus, whereas for Leibniz the problem of the continuity of space and time requires us to posit nonspatiotemporal simples, Kant claims that the mathematical estimation of magnitudes relies upon the subjective unities apprehended in intuition.

This requirement arises from the non-comparative nature of the aesthetic measure: Kant asserts that only a subjective measure can be absolute, because any objective measure would depend upon determinations of the understanding, which, as such, can only be comparative. Kant adds that this “measure” may be either empirical or a priori, but it is always restricted to the “subjektive Bedingungen der Darstellung” (*KdU*, §25, Ak. 5:249). According to the criteria Kant sets out in the opening sections of the third *Critique*, for the judgment of magnitude to be “subjective” implies that it has its seat not in the understanding but in the faculty of judgment and that it must give the subject a feeling of her own purposiveness with regard to this faculty.⁹ Although it is not objective, this judgment nevertheless—like the pure judgments of taste considered in the earlier sections on the beautiful (*KdU*, §§6–8, Ak. 5:211–219)—makes a claim for universal agreement. These subjective conditions derive from the nature of the subject’s faculties, and Kant proposes that the subject experiences a particular feeling of the self when making judgments of aesthetic magnitude: he thus introduces a feeling of measurement. Kant thereby connects two senses of the term “aesthetic”: one pertaining to the conditions of sensibility, space and time; the other denoting a mode of reflective judgment connected a priori to feeling. The estimation of magnitudes in mere intuition is

⁹ For the claim that aesthetic magnitude must be a principle of judgment and must rely upon a subjective purposiveness of representation, see §25: “Es muß also ein Begriff der Urteilkraft sein, oder von einem solchen abstammen und eine subjektive Zweckmäßigkeit der Vorstellung in Beziehung auf die Urteilkraft zum Grunde legen” (Ak. 5:248).

“aesthetic” in both senses: the limits of our intuitive capacities as finite beings determine what functions as a unity for a reflective judgment of things as “groß” or “klein.”

Judgments of aesthetic magnitude are universal in another sense as well—just as everything in appearance has a quantity, as argued in the Axioms of Intuition (as well as a determinate intensive magnitude, as argued in the Anticipations of Perception), so, too, must everything possess an aesthetic magnitude. In a short, seemingly isolated passage in §25, Kant remarks upon this feature of judgments of magnitude:

Übrigens geht die Beurteilung der Dinge als groß oder klein auf alles, selbst auf alle Beschaffenheiten derselben; daher wir selbst die Schönheit groß oder klein nennen; wovon der Grund darin zu suchen ist, daß was wir nach Vorschrift der Urteilkraft in der Anschauung nur immer darstellen (mit ästhetisch vorstellen) mögen, insgesamt Erscheinung, mithin auch ein Quantum ist. (Ak. 5:249–250)

By describing all appearance as a *quantum*, Kant seems simply to endorse the “mathematization” of all experience: all created things, their properties, and even their beauty itself are judged to possess a magnitude and therefore to be measurable. In the *Ontologia*, Christian Wolff states this claim particularly clearly: “Nothing is given in things ... of which it is not possible for there to be a mathematical cognition.” Not just quantities but also qualities can be measured: “For qualities have degrees ... and a degree can be thought of as composed from other smaller ones or parts.”¹⁰ Wolff revives the term “intensive magnitude” in the service of this project, defining “*intensitas* or *intensio*” as “something like a multitude of degrees, in the way that a magnitude is a

¹⁰ Christian Wolff, *Ontologia*, in *Gesammelte Werke*, ed. Jean École et al. (Hildesheim: Olms, 1962–), I/2, §756: “*Nihil datur in rebus ... cujus non possibilis sit cognitio mathematica*”; §757: “*Etenim Qualitates habent gradus. ... Gradus autem unus concipi potest tanquam compositus ex aliibus minoribus veluti partibus.*”

multitude of parts.”¹¹ Kant follows Wolff in extending the field of the mathematically describable to, simply, “alles”—everything, that is, within nature. In the first *Critique*, Kant claims that everything presented in intuition has extensive magnitude and the real of all perception has an intensive magnitude. As he recapitulates in the passage cited above, everything we represent in intuition is a *quantum*. Earlier in the same section, Kant claims that any object is a *quantum* “wenn nämlich Vielheit des Gleichartigen zusammen Eines ausmacht” (Ak. 5:248). Since appearances all contain a multitude within a unity, this implies that all empirical objects satisfy the definition of a *quantum*. But, in the *Analytic of the Sublime*, Kant goes further. He argues from the claim that we intuit everything as a unity possessing a particular extensive and intensive magnitude to the conclusion that all appearances can be aesthetically judged as “groß” or “klein.” Kant thus cites the thesis from the first *Critique* as a justification for his new contention that everything can be *aesthetically* judged—and, more strongly, that all mathematical judgments of quantity depend upon aesthetic judgments.

Kant’s argument for the claim that everything in nature has an aesthetic measure is based on his analysis of four types of judgment of quality. In the “Nominal Definition of the Sublime,” (*KdU* §25, Ak. 5:248–250), Kant introduces these judgments and uses them to explain the concept of the sublime at the end of the section. In §§1.1–1.2, I would like to characterize these types of judgment and consider their relationship to intensive and extensive magnitudes. I will argue that Kant’s thesis that all mathematical estimations of quantity are “in the end ... aesthetic” (*zuletzt ästhetisch*) (Ak. 5:251) means

¹¹ Wolff, *Ontologia*, *Gesammelte Werke*, I/2, §759: “ut adeo *Intensitas* sive *Intensio* fit quasi graduum multitudo, quemadmodum magnitudo partium multitudo.”

that all estimations of magnitude depend upon the representation of something as possessing an intensive magnitude.¹² More specifically, Kant's claim that the mathematical estimation of magnitudes requires "grasping [something] immediately in an intuition" implies that the subject must determine this representation as an intensive magnitude before she can use it to make judgments concerning extensive magnitudes.

Before considering the different types of judgments of quantity, it will be helpful to recall Kant's distinction between intensive and extensive magnitudes from the first *Critique*. In the Anticipations of Perception, Kant writes: "Nun nenne ich diejenige Größe, die nur als Einheit apprehendiert wird, und in welcher die Vielheit nur durch Annäherung zur Negation = 0 vorgestellt werden kann, die intensive Größe" (A168/B210). Extensive magnitudes are those " ... in welcher die Vorstellung der Teile die Vorstellung des Ganzen möglich macht, (und also notwendig vor dieser vorhergeht)" (A162/B203). The distinction concerns the priority of our representation of the parts to our representation of the whole. Magnitudes are extensive when our representation of the parts makes possible our representation of the whole; they are intensive when our representation of the whole makes possible our representation of the parts (or, since intensive magnitudes may not have "parts" in the strict sense, where our representation of the whole makes possible our representation of the multiplicity). One and the same object can be considered either as an extensive or intensive magnitude, in accordance

¹² Although all aesthetic magnitudes are intensive, not all intensive magnitudes are aesthetic. The Anticipations establish as a determinative principle of the understanding that the real in appearances has an intensive magnitude or degree. This kind of determinative judgment attributing a particular magnitude to the real in appearance must first be distinguished from the intensive magnitudes Kant refers to in the *Analytic of the Sublime*. As this discussion will show, however, the problems attending the determinative judgments considered in the Anticipations are once again addressed in Kant's theory of aesthetic magnitude.

with the relevant order of priority of parts and whole in representation. Thus, my claim is that all mathematical judgments of quantity depend upon representing something as a whole prior to its parts.¹³

1.1 Four types of quantitative judgment

Kant's discussion of the different concepts of quantity can be summarized by contrasting four types of quantitative judgments:

(1) *S* is a *quantum*.

Roughly, this judgment means that *S* is a *quantum* if and only if for some unit *u* there is a multiplier *k* such that *S* has *k* times the magnitude of *u*. In §25, Kant notes: "Das etwas eine Größe (*quantum*) sei, läßt sich aus dem Dinge selbst ohne alle Vergleichung mit anderen erkennen: wenn nämlich Vielheit des Gleichartigen zusammen Eines ausmacht" (Ak. 5:248). The judgment that such a *k* exists can be made without any act of comparison between *S* and anything else. It follows merely from the fact that *S* is one composed out of many. Any object presented in intuition will be this sort of "one." The judgment is therefore a priori.

¹³ Malcolm Budd, on the other hand, argues that "Kant's claim that there is a greatest aesthetic unit of measurement is based on his conception of an extensive magnitude. For Kant, a magnitude is extensive if the representation of the parts makes possible, and therefore necessarily precedes, the representation of the whole. Spatial objects are extensive magnitudes, and so can be intuited only through successive synthesis of part to part." Budd, "The Sublime in Nature," in Paul Guyer, ed., *Kant's "Critique of the Power of Judgment": Critical Essays* (Lanham: Rowman & Littlefield, 2003), 121–142 at 123. Budd's description leaves out two central elements of Kant's theory that pertain to intensive magnitudes: first, he does not consider the question of the nature of the magnitude of the unit of measurement itself, but instead treats it as *simple*. This is incompatible with the infinite divisibility of space and time. Second, Budd omits from his account the fact that space and time themselves are *not* composed from successive synthesis but are infinite given wholes. He thus neglects the fundamental interdependence between extensive and intensive magnitudes.

Judgments of this form reflect Kant's thesis that all intuitions are extensive magnitudes. Kant seeks to establish this claim in the first section of the Principles of the Pure Understanding in the first *Critique*. In Kant's view, the claim that all appearances are extensive magnitudes is required for the applicability of mathematics to the objects of experience. Kant argues that, as intuitions, appearances are represented through the same sort of synthesis as is required for spatiotemporal determination. The principle of the Axioms is that all appearances are extensive magnitudes "weil sie als Anschauungen im Raume oder der Zeit durch dieselbe Synthesis vorgestellt werden müssen, als wodurch Raum und Zeit überhaupt bestimmt werden" (B203). Kant's proof of this principle depends upon the claim that all appearances in intuition can only be cognized (*erkannt*) through a successive synthesis in apprehension.¹⁴ In the proof added in the B addition, Kant further claims that the "die Wahrnehmung eines Objekts, als Erscheinung [ist] nur durch dieselbe synthetische Einheit des Mannigfaltigen der gegebenen sinnlichen Anschauung möglich, wodurch die Einheit der Zusammensetzung des mannigfaltigen Gleichartigen im Begriffe einer Größe gedacht wird." Kant claims here that to perceive an object requires the *same synthetic unity* as is used to form a concept of magnitude. This seems to entail that an act of (successive) synthesis is required to perceive an object.¹⁵

¹⁴ "Ich kann mir keine Linie, so klein sie auch sei, vorstellen, ohne sie in Gedanken zu ziehen, d.i. von einem Punkte alle Teile nach und nach zu erzeugen, und dadurch allererst diese Anschauung zu verzeichnen" (A162–163/B203). Lewis White Beck, *Essays on Kant and Hume*, 144, and James van Cleve, *Problems from Kant*, 86, have both objected that this "sensational" or "perceptual" atomism is implausible: don't we simply perceive complex things in a single glance? For a proposed solution to this problem, see Sacha Golob's recent article "Kant on Intentionality, Magnitude, and the Unity of Perception."

¹⁵ The passage might be read in two different ways, however. First, one might claim that Kant is asserting that the very same act of synthesis that is required to perceive objects is that through which the concept of a magnitude is formed. This would imply a very close connection between

(2) S is k units large.

This type of judgment answers the question “Wie groß?” something is. It compares S to a unit and determines the size of S in relation to this unit. Kant calls this unit a “measure” (*Maß*) and notes that the measure itself is also a quantum (*Größe*). The measure is a particular: the logical form of the predicate expression “... is k units” is to be analyzed as “... is k times as long as u ”, where u is an object denoted by a singular term. For example, the judgment “This tower is 70 meters high” takes the meter as a measure and determines the proportion of the tower to the measure. The tower is seventy times as high as one meter. The meter is not to be confused with any standard object that is one meter long. Since the measure is itself a *quantum*, this type of judgment does not provide an “absolute” determination of how large S is. It simply states a relationship, a comparative determination, of the size of S with respect to the measure or unit: “Weil es aber in der Beurteilung der Größe nicht bloß auf die Vielheit (Zahl), sondern auch auf die Größe der Einheit (des Maßes) ankommt, und die Größe dieser letztern immer wiederum etwas Anderes als Maß bedarf, womit sie verglichen werden könne: so sehen wir, daß alle

the synthesis required for the perception of an object and concept formation. But a weaker reading of this passage is also possible, according to which both perception of an object as appearance and the concept of magnitude both rely upon the same synthetic unity, but the formation of the concept of magnitude involves an additional act of the understanding. I think this second reading accords better with Kant’s views on the relationship between perceptual synthesis and concept formation, though I will not defend this here. The passage raises the controversial question of whether Kant holds that the perception of an object requires conceptual activity and, if so, of what sort. For an account that distinguishes perceptual synthesis from the application of a concept, see Stefanie Grüne, “Begriffe als Regeln der Wahrnehmung,” in Valerio Rhoden, Ricardo R. Terra, and Guido A. de Almeida, eds., *Proceedings of the 10th International Kant Congress* (Berlin: de Gruyter, 2008), 255–265. For a discussion of Kant and non-conceptualism, see Lucy Allais, “Kant, Non-Conceptual Content and the Representation of Space,” *Journal of the History of Philosophy* 47 (2009): 383–413. For a consideration of the quantitative syntheses in relation to judgment, see Béatrice Longuenesse, *Kant and the Capacity to Judge*, trans. Charles T. Wolfe (Princeton: Princeton University Press, 1998), 243–291.

Größenbestimmung der Erscheinungen schlechterdings keinen absoluten Begriff von einer Größe, sondern allemal nur einen Vergleichungsbegriff liefern kann” (Ak. 5:248).

These judgments are “mathematical” (Ak. 5:251) because they provide a determination of the proportional relationship between two *quanta*—how many, or the “Vielheit,” of the one *quanta* compose the other. Since space and time are themselves *quanta continua*, there is never an absolutely smallest unit from which a non-comparative determination of quantity could be constructed. Kant summarizes this point by denying that we can ever constitute a *Grundmaß*, a first or absolute measure, through the mathematical estimation of quantity. Any unit can be represented as a multiplicity. To summarize: judgments of quantity (*quantitas*) are objective and comparative. Their possibility is grounded in the a priori principle of the Axioms that any two appearances, as *quanta*, can be compared with respect to their size and that this relationship can be mathematically determined.

(3) *S* is large (... small, mid-sized, etc. ...).

Kant calls judgments of this form judgments of magnitude *simpliciter*. They at least appear to predicate magnitude of a subject without any act of comparison: “Wenn ich nun schlechtweg sage, daß etwas groß sei, so scheint es, daß ich gar keine Vergleichung im Sinne habe, wenigstens mit keinem objectiven Maße, weil dadurch gar nicht bestimmt wird, wie groß der Gegenstand sei” (Ak. 5:248). Although these judgments do not determine the size of an object with respect to an “objective measure,” Kant thinks that they require a “subjective” standard of comparison:

Weil aber in einem Urtheile, wodurch etwas schlechtweg als groß bezeichnet wird, nicht bloß gesagt werden will, daß der Gegenstand eine Größe habe, sondern diese ihm zugleich vorzugsweise vor vielen andern gleicher Art beigelegt wird, ohne doch diesen Vorzug bestimmt anzugeben: so wird demselben allerdings

ein Maßstab zum Grunde gelegt, den man für jedermann als eben denselben annehmen zu können voraussetzt, der aber zu keiner logischen (mathematisch-bestimmten), sondern nur ästhetischen Beurtheilung der Größe brauchbar ist, weil er ein bloß subjectiv dem über Größe reflectirenden Urtheile zum Grunde liegender Maßstab ist. (Ak. 5:249)

Empirical measures and measures with intensive magnitude provide Kant with examples here. He is interested in establishing that our ordinary judgments of something as large or small can be made with respect to *any standard whatsoever provided that we take it as absolute*:

Er [der Maßstab] mag übrigens empirisch sein, wie etwas die mittlere Größe des uns bekannten Menschen, Tiere von gewisser Art, Bäume, Häuser, Berge u. dgl., oder ein a priori gegebener Maßstab, der durch die Mängel des beurteilenden Subjekts auf subjective Bedingungen der Darstellung *in concreto* eingeschränkt ist; als im Praktischen: die Größe einer gewissen Tugend oder der öffentlichen Freiheit und Gerechtigkeit in einem Lande; oder im Theoretischen: die Größe der Richtigkeit oder Unrichtigkeit einer gemachten Observation oder Messung u. dgl. (KdU, §25, Ak. 5:249)

The *Grundmaß* is not determined by its content but by whatever is actually grasped in intuition as the unity in the specific case. Furthermore, although the empirical object used is used to determine the *Grundmaß*, Kant should not be interpreted as identifying the measure with the object itself. Consistent with Kant's definition in the second type of judgment of quantity, measure is neither a property of concrete objects nor is it identical to the empirical object used to introduce it. Instead, it is an abstract particular. Kant claims here that judgments of magnitude *simpliciter* invoke a unique measure that is taken as universal. When I say "This tower is high," I implicitly compare the tower to a particular standard. It seems as if this standard may be vague: I certainly do not need to have a determinate concept of the exact length of the standard invoked in my judgment. This raises the question of whether the standard itself is a vague object—leading to worries about the coherence of attributing vagueness to things in the world—or whether

there is some other explanation for the vagueness of my concept of the measure. One suggestion might be that I am picking out a determinate thing but that I am not aware of its exact contours.

One might object that the fact that these judgments do not explicitly provide a standard of comparison does not justify treating them as products of a separate cognitive faculty. For, Kant concludes that the measure for such judgments lies in “reflective judgment” and not in the understanding. All in all, despite such judgments not stating the standard of comparison, they nevertheless invoke such a standard and assume universal accord with this standard. Judgments of magnitude *simpliciter* thus appear to be disguised judgments of comparison of the form “*S* is larger than *T*” where *T* is not stated but presupposed. For instance, when I say, “This tower is high,” perhaps I should be taken as asserting “This tower is high with relation to a normal tower” or to some other norm. What that norm is would be determined by a particular circumstance of utterance, but some such measure must be presupposed for my assertion to be understood. It is not difficult to imagine circumstances in which this suppressed objective measure would be easily comprehended. For example, a city might pass a regulation specifying that no tower exceed sixty meters in height. If a tower were constructed of seventy meters in height and the city inspector were to exclaim, “This tower is high!” it would be clear what norm or *Maßstab* was relevant. Although this is a particularly obvious case, perhaps all judgments of magnitude *simpliciter* reduce to judgments of this form. In Germany, a standard glass of whisky consists of 2 cl. When my drink arrives, I notice that my glass contains at least 3 cl, and I happily proclaim, “This is a large drink!” Again, it seems that I am implicitly

comparing the quantity of whisky in my glass with an objectively fixed measure written into law. The two features Kant claims distinguish judgments of magnitude *simpliciter* from comparative judgments of quantity—that the measure is not explicitly stated and no answer to the question “how much?” is given—do not appear to justify concluding that the measure is merely subjective or that it arises from a concept of the faculty of judgment.

This objection seems far less compelling when we recall Kant’s distinction between determinative and reflective judgments. In the Introduction to the *Kritik der Urteilkraft*, Kant characterizes the faculty of judgment as “das Vermögen, das Besondere als enthalten unter dem Allgemeinen zu denken. Ist das Allgemeine (die Regel, das Princip, das Gesetz) gegeben, so ist die Urtheilskraft, welche das Besondere darunter subsumirt ... bestimmend. Ist aber nur das Besondere gegeben, wozu sie das Allgemeine finden soll, so ist die Urtheilskraft bloß *reflektierend*” (Ak. 5:179). For Kant to assert that judgments of magnitude *simpliciter* rely upon a reflective judgment means that the mind must search for the proper *Maßstab*. In this regard, judgments of magnitude *simpliciter* are akin to judgments of empirical science that seek a rule or general concept under which to subsume particulars. In the example of the too-high tower, this search for a proper standard was so quick as to be almost unnoticeable—clearly, the subject does not have to engage in conscious deliberation in order to arrive at the appropriate *Maßstab*. Nevertheless, Kant thinks that the form of this judgment—its failure to provide the general concept under which the particular is subsumed—indicates that some work of the imagination is necessary for us to understand the meaning of this judgment. One must

supply the relevant *Maßstab* through a contextually-determined process that relies upon the imagination's ability to recall other instances, to compare them with the present case, and to pick out the relevant concept. Kant claims that this activity requires us to exercise a different cognitive faculty from that which we use to understand a mathematical judgment of measurement.

Despite the measure's being subjective, the judgment lays claim to universal approval.¹⁶ It asserts that "S is large" with regard to a measure that everyone should possess. This demand is required to explain why one seeks the measure. It is because we are responsive to the normative force of such judgments that we engage in a process of (conscious or unconscious) reflection aimed at determining the appropriate *Maßstab*. In addition, Kant remarks that we can judge all things—and even all properties of things—to be large or small: "wovon der Grund darin zu suchen ist, daß, was wir nach Vorschrift der Urtheilskraft in der Anschauung nur immer darstellen (mithin ästhetisch vorstellen) mögen, insgesamt Erscheinung, mithin auch ein Quantum ist" (Ak. 5:249–250). Our ability to make judgments of magnitude *simpliciter* for all things represented in intuition is grounded in the same principle that allows us to make mathematical judgments of quantity: that everything represented in intuition is a *quantum*. This claim provides a first indication of the relation among the different types of quantitative judgments. Judgments of the second and third types depend upon the principle that everything is represented in intuition as a unity composed of a multiplicity.

¹⁶ There is another important feature of these judgments that I am not considering here: their connection with the subjective purposiveness (Ak. 5:249). This is central to Kant's account of the role of feeling in judgments of magnitude; however, it is not directly relevant to the question of intensive magnitudes.

(4) S is absolutely large.

To say that S is “schlechthin groß” means that, for every unit, u , S is large with respect to u . This, Kant writes, is to claim that it is large “über alle Vergleichung.” We can make no true judgment of the second type for this object. “ S is absolutely large” thus entails “there is no measure, u , and no multiplier, k , such that S is u times k large.” Although judgments of the fourth type entail negative judgments, it is important to note that they are affirmative in form. They predicate “absolutely large” of a subject. I will return to this question in §3 of the chapter, where I will suggest that the predicate “absolutely large” is akin to the predicates encountered in infinite judgment. Indeed, I think that judgments of the fourth type are a class of infinite judgments.

1.2 *Alle Größenschätzung der Gegenstände der Natur ist zuletzt ästhetisch*

In the first paragraph of the following section, “Von der Größenschätzung der Naturdinge, die zur Idee des Erhabenen erforderlich ist,” Kant argues that all estimations of the quantities of objects of nature are grounded upon a form of estimation that occurs in “mere” intuition. While Kant draws upon the distinctions established in the previous section among types of quantitative judgments, he introduces two further concepts of measure in order to establish his conclusion: the *Augenmaß* and the *Grundmaß*. An *Augenmaß* is a measure presented in mere intuition and therefore aesthetic; a *Grundmaß* is a first, fundamental, absolute measure. Kant’s thesis that “Alle Größenschätzung der Gegenstände der Natur ist zuletzt ästhetisch” can thus be divided into two claims: First, the estimation of the quantities of the objects of nature has a *Grundmaß*. Second, this

Grundmaß is always an *Augenmaß*. Kant further claims that the second thesis implies that the estimation of magnitudes is determined subjectively and not objectively. Kant's discussion in this section can be broken down into seven steps. Several of them are only implicit in the paragraph, and each requires commentary, but I shall first list them to give a sense of the overall structure of the argument:

1. All estimation of magnitudes is either mathematical or aesthetic.
2. A *Grundmaß* can only be provided by an estimation of magnitudes.
3. Mathematical estimation of magnitudes can never provide a *Grundmaß*.
4. Either the mathematical estimation of magnitudes does not have a *Grundmaß*,
or the *Grundmaß* is provided by the aesthetic estimation of magnitudes.
5. If the mathematical estimation of magnitudes did not have a *Grundmaß*, then it
could have no “determinate” concept of a given quantity.
6. But the mathematical estimation of magnitudes does have a “determinate”
concept of a given quantity, so it must have a *Grundmaß*.
7. This *Grundmaß* must be provided by the aesthetic estimation of magnitudes,
i.e. it must be an *Augenmaß*.

In the first sentence of §26, Kant contrasts the estimation of magnitudes through numerical concepts (or algebraic signs) with estimation in intuition through the *Augenmaß*. While he does not explicitly state that these two forms of estimation are exhaustive, his subsequent discussion seems to rely on this. The claim is not obvious, however, and might seem implausible in light of the range of objects that can be quantitatively estimated—degrees of beauty, public freedom and justice in a country, or

the correctness of an observation. Premise (1) can be supported, however, by recalling Kant's assertion in §25 that both judgments of magnitude *simpliciter* and those of comparative quantity can be applied to all appearances represented in intuition because appearances are *quanta*, that is, because whatever is represented in intuition is an extensive magnitude. Appearances can only be measured because they are represented in space and time. Since measurement relies upon the correspondence between the formal properties of intuition and the concepts of number, it seems that the formal properties of intuition and the concepts of number would constitute the sole sources of the estimation of magnitudes. But why think there are two different kinds of measurement? Couldn't mathematical estimation of magnitude be all there is? First, Kant could appeal to our ordinary judgments of magnitude to support the claim that there is such a thing as aesthetic measurement: when I say "The cup on the left is bigger than the cup on the right," it seems that I am comparing two objects presented to me in intuition with regard to their size, which I "take in in a single glance" prior to applying any mathematical concepts. (This would be a comparative aesthetic judgment.) This sort of consideration can provide initial motivation for the first premise of the argument; we will see later why the aesthetic estimation of magnitude is the bedrock form for all quantitative estimations.

Premise (2) follows from Kant's initial characterization of a measure in §25: a measure is something that relates one quantum to another; the *Grundmaß* is the most basic measure of measurement. Since a unit of measurement cannot be determined except through some procedure of *Größenschätzung*, the *Grundmaß* must be determined either by aesthetic or by mathematical estimation. Kant argues for premise (3) by recalling

that all mathematical estimation of magnitudes determines a whole as a multiple of units that themselves are wholes requiring a measure. This is the same argument Kant invoked in claiming that all mathematical judgments of quantity can be merely comparative. Since the measure in any mathematical estimation of magnitudes is itself a quantum, a unity of multiplicity, this measure will itself require further mathematical estimation and will never reach a stopping place. The mathematical estimation of quantity can go on indefinitely, because all quanta are further divisible. Step (4) follows from (1), (2), and (3).

The next two claims result in the first thesis mentioned above: that the mathematical estimation of quantities has a *Grundmaß*. Kant does not state this explicitly, and one might offer an alternative reconstruction that would deny this thesis and explain his claim that “alle Größenschätzung der Gegenstände der Natur ist zuletzt ästhetisch” as resulting from mathematical estimation’s lacking a *Grundmaß*. Since the aesthetic estimation of magnitude can provide a *Grundmaß*—this argument would go—it is more fundamental than mathematical estimation, and Kant is making just this claim when he says that estimation is “zuletzt ästhetisch.” I think, however, that a reading attributing a *Grundmaß* to mathematical estimation (one that it does not provide but which it borrows from aesthetic estimation) makes more sense of Kant’s commitment to the determinacy of mathematical judgments. Kant writes, for instance, “Nun können wir zwar bestimmte Begriffe davon, wie groß etwas sei, nur durch Zahlen ... bekommen, deren Einheit das Maß ist; und sofern ist alle logische Größenschätzung mathematisch. Allein da die Größe des Maßes doch als bekannt angenommen werden muß, so würden, wenn diese nun wiederum nur durch Zahlen, deren Einheit ein anderes Maß sein müßte, mithin

mathematisch geschätzt werden sollte, wir niemals ein erstes oder Grundmaß, mithin auch keinen bestimmten Begriff von einer gegebenen Größe haben können” (Ak. 5:251). It is clear here that Kant thinks that we do have determinate concepts of given quantities and that we could not have them if mathematical estimation did not have a *Grundmaß*. Kant’s distinction between reflective and determinative judgments (Ak. 5:179) helps to show what he means here by a “bestimmte Begriff.” As mentioned earlier, in a determinative judgment the “general”—the rule or principle—is provided, whereas in a reflective judgment one must seek the general under which the particulars fall. In the case of a “bestimmter Begriff von einer gegebenen Größe,” this would mean that there has to be something that fixes the reference of the measuring concept as the measure itself. If all estimation of quantity were mathematical, this would not be possible.

Take the case of the mythical meter stick in Paris. In the last section, I discussed a seventy meter tower. My comparative, mathematical judgment, “This tower is seventy meters high” states a relationship between a unit, the meter, and the tower—the tower is seventy times as high as the meter. Without some reference object—for instance, the standard meter—it would not be possible to apply the concept of the meter determinately in relation to the tower. Mathematical estimation cannot fix such a reference because it can only provide comparisons among its concepts—it can say that a meter is composed of a hundred centimeters, but it cannot provide the conditions of application of “meter” to a particular object. It is important to note that this measure, the meter, is not identical to the empirical stick used as a standard, although the reference of the concept of meter can only be fixed through a baptismal act involving this stick. When I say, “Let this be a

meter,” I mean that the length that this object has shall henceforth be a meter.¹⁷ I take Kant’s claim that all mathematical estimation of magnitudes is “zuletzt ästhetisch” as meaning that for an estimation of quantity to be determinate, some *Grundmaß* must be set in intuition so that mathematical concepts can “hook on” to particular objects. Without this aesthetic *Grundmaß*, we could not even compare the magnitudes of appearances in relation to one another.

This explanation of the *Grundmaß* shows why it must possess an intensive magnitude. The *Grundmaß* is not itself a simple—as a *quantum* (like everything presented in intuition), it may itself be considered a unity containing a multiplicity of smaller unities. What we can adopt as a *Grundmaß* must obey certain constraints—in particular, it must be such that we can grasp it within a single intuition—however, what we take as a *Grundmaß* can vary from one instance to another. There is no principled reason why a particular unit “grounds” estimations of magnitude other than that I take it as the reference unit for my estimations of magnitude. But to take it as a basic unit in this sense means to attribute unity to it prior to its division into parts or degrees. I consider it as *one* and as only implicitly many. In this sense, I take it as possessing an intensive magnitude. I do not consider it as a whole composed out of more fundamental parts but fix it as the unit through which I can estimate the magnitude of other objects. I must consider it *both* as a fundamental unity and as a *quantum* capable of diminution. If I did not take it “as

¹⁷ Kant’s account of reference fixing accords, at least in general outline, with Saul Kripke’s discussion of reference fixing in *Naming and Necessity* (Cambridge: Harvard University Press, 1980), 55. According to Kripke, the reference of “meter” is determined through a baptismal chain. Judgments such as “The standard meter stick is one meter long” are contingent a priori: the meter stick could have been a length different from what it actually is, but since it is the length that it in fact is, we can know this prior to measuring it.

one”—and as a whole in a single intuition—it could not fix the reference of my mathematical concepts. On the other hand, if I did not consider it as itself a *quantum*, I would deny the applicability of geometry to the objects presented in intuition. Estimating magnitudes thus requires taking the *Grundmaß* as possessing an intensive magnitude. For this reason, Kant’s claim in the Axioms that all appearances presented in intuition must have an extensive magnitude for us to employ geometry must be augmented by the further thesis that we must be able to take appearances as intensive magnitudes—as unities prior to their parts. These claims do not conflict: one and the same representation can be taken as an extensive and an intensive magnitude, just as one representation can serve as a *Grundmaß* in one context and not in others. When we do take a representation as a *Grundmaß*, however, we are thereby treating it as an intensive magnitude, as a whole given prior to its parts.

1.3 From the great beyond all comparison to the sublime

As we have seen, in the opening sentences of the “*Namenerklärung des Erhabenen*,” Kant writes that it is utterly different to say “*simpliciter*” that something is “*groß*” and that it is “*schlechthin groß*.” He immediately defines the latter to be that which is “*über alle Vergleichung groß*” (*KdU*, §25, Ak. 5:248). This maximum awakens the feeling of the sublime (*KdU*, §26, Ak. 5:252). Although Kant insists upon the dissimilarity between that which is great beyond all comparison and that of which we can judge non-comparatively that it is great, these two concepts are nevertheless connected in their reliance on aesthetic magnitude. This emerges in Kant’s discussions of “aesthetic measures” and the

“absolute measure” and rests on Kant’s claim that only an aesthetic measure can have a greatest degree. It implies not only that anything that is “schlechthin groß” must be “groß simpliciter” but that both concepts depend upon the same sort of reflective judgment. Not only every estimation of a *Grundmaß* but also every determination of a maximum must be aesthetic (Ak. 5:251). In his initial characterization of the absolutely great, Kant writes that we can immediately see that we can come up with “keinen ... angemessenen Maßstab” for what is absolutely “groß,” other than the thing itself: “Es ist eine Größe, die bloß sich selber gleich ist” (*KdU*, §25, Ak. 5:250). This incomparability of the sublime implies, Kant adds, that nothing within nature can be properly termed “sublime,” but that the sublime is instead to be found in our ideas. He follows this with an illustration of the claim that everything in nature is comparative, in lines that nearly paraphrase Pascal’s description of relative magnitude in his fragment, “Disproportion of Man.”¹⁸

¹⁸ In his “On the Sublime, Infinity, *Je Ne Sais Quoi*: 1674, Nicolas Boileau-Despréaux Translates from the Greek Longinus’ Treatise *On the Sublime*,” in Denis Hollier et al., eds., *A New History of French Literature* (Cambridge, Mass.: Harvard University Press, 1989), 340–345, Louis Marin argues that Pascal anticipates Kant in his treatment of the infinite and the sublime. Marin points out the affinity between the two depictions of the sublime, but uses this to suppress Leibniz, preferring to cast him in the role of the arch-rationalist who was unable to see the sublime in his rush to comprehend it rationally: “Unlike Gottfried Wilhelm von Leibniz (1646–1716), who would master the challenges of the infinite in the domains of knowledge, ethics, and metaphysics, Pascal made the infinite both the distinctive feature of human experience and the decisive basis for questioning the conditions of knowledge, the imperatives of ethics, and the requirements of faith. Pascal’s treatment of the infinite subsequently provided the Romantics with an aesthetic model, that of the fragment, for sublime writing” (344–345). See also Marin’s chapter, “The Sublime in the 1670s: Something Indefinable, a ‘Je ne sais quoi’?” in his *Sublime Poussin*, trans. Catherine Porter (Stanford: Stanford University Press, 1999), 209–223. As we have seen, however, Leibniz in fact radicalizes Pascal’s treatment of infinity in Leibniz’s own essay, “Infinité” (KS 372–385, Grua 554–559).

Pascal introduces his meditation on man's double status, as nothing in relation to the whole of the universe but as an infinity with respect to the nothing, in several lines devoted to man's precarious place in the middle of these two infinities:

Que l'homme contemple donc la nature entière dans sa haute et pleine majesté, qu'il éloigne sa vue des objets bas qui l'environnent. Qu'il regarde cette éclatante lumière mise comme une lampe éternelle pour éclairer l'univers, que la terre lui paraisse comme un point au prix du vaste tour que cet astre décrit, et qu'il s'étonne de ce que ce vaste tour lui-même n'est qu'une pointe très délicate à l'égard de celui que ces astres, qui roulent dans le firmament, embrassent. Mais si notre vue s'arrête là que l'imagination passe outre, elle se lassera plutôt de concevoir que la nature de fournir. Tout le monde visible n'est qu'un trait imperceptible dans l'ample sein de la nature. Nulle idée n'en approche, nous avons beau enfler nos conceptions au-delà des espaces imaginables, nous n'enfantons que des atomes au prix de la réalité des choses. ... Mais pour lui présenter un autre prodige aussi étonnant, qu'il recherche dans ce qu'il connaît les choses les plus délicates, qu'un ciron lui offre dans la petitesse de son corps des parties incomparablement plus petites, des jambes avec des jointures, des veines dans ses jambes, du sang dans ses veines, des humeurs dans ce sang, des gouttes dans ces humeurs, des vapeurs dans ces gouttes, que divisant encore ces dernières choses il épuise ses forces en ces conceptions et que le dernier objet où il peut arriver soit maintenant celui de notre discours. Il pensera peut-être que c'est là l'extrême petitesse de la nature.¹⁹

Pascal's discussion culminates in a polemic against extremes: man is unsuitable for both the nothing and the everything; our senses cannot perceive the very faint and are overwhelmed by the overly intense; the "too much" is no more experienced than the "too little," and we must remain within the narrow medium. He pleads for man to abandon the search for final "stability," to give up the attempt to begin with first principles and to reach infinity, because only in accepting the instability of all knowledge can he be at rest. Man is, however, disproportionate in a second sense, according to Pascal: he is out of proportion with himself, because he is himself the link between two absolutely incongruous things, the combination of that which is utterly dissimilar. As a

¹⁹ Blaise Pascal, *Pensées* nr. 199, in *Œuvres complètes*, ed. Louis Lafuma (Paris: Seuil, 1963), 525–526.

unity of mind and body, man combines within him what is fully disjoint. This duality of man's nature is the ultimate source, Pascal writes, for the disproportion between man and the universe, and it is this incongruity with himself that makes man "le plus prodigieux objet de la nature."²⁰ Pascal's argument here resembles Kant's in several ways.

Like Pascal, Kant depicts the possibly infinite increases and decreases in magnitude when we take ever-larger or smaller objects as our *Maßstab*: "Hier sieht man leicht, daß nichts in der Natur gegeben werden könne, so groß als es auch von uns beurteilt werde, was nicht in einem anderen Verhältnisse betrachtet bis zum Unendlichkleinen abgewürdigt werden könnte" (*KdU*, §25, Ak 5:250).²¹ Nothing in nature can be incomparable or provide an "absolute measure." Such a measure arises, however, from the "disproportion" between our imagination, which attempts to proceed infinitely, and our reason's demand for totality:

Aber eben darum, daß in unserer Einbildungskraft ein Bestreben zum Fortschritte ins Unendliche, in unserer Vernunft aber ein Anspruch auf absolute Totalität als auf eine reelle Idee liegt, ist selbst jene Unangemessenheit unseres Vermögens der Größenschätzung der Dinge der Sinnenwelt für diese Idee die Erweckung des Gefühls eines übersinnlichen Vermögens in uns; und der Gebrauch, den die Urteilskraft von gewissen Gegenständen zum Behuf des letzteren (Gefühls) natürlicherweise macht, nicht aber der Gegenstand der Sinne ist schlechthin groß, gegen ihn aber jeder andere gebrauch klein. ...Wir können also zu den vorigen Formeln der Erklärung des Erhabenen noch diese hinzutun: *Erhaben ist, was auch nur denken zu können ein Vermögen des Gemüts beweist, das jeden Maßstab der Sinne übertrifft.* (Ak. 5:250)

The disproportion of all sensory measures to the measurement of the absolutely great is what occasions the feeling of the sublime in us. "Unangemessenheit," Pascal's disproportion, provides a "negative measure": the very in-comparability of the absolutely

²⁰ Pascal, *Pensées*, nr. 199, in *Œuvres complètes*, 528.

²¹ Towards the end of §26, Kant dramatically depicts a series of ever-increasing measures to show the genesis of our feeling of the sublime (Ak 5:256–257).

great to anything within nature is what allows us to experience the absolute. In this passage, Kant provides the first indication of the relation between the sublime and negation that he develops later in his conception of “negative Darstellung.” Here, Kant writes of a conflict between “ein Bestreben unserer Einbildungskraft zum Fortschritte ins Unendliche” and the “Anspruch auf absolute Totalität” brought about by our reason. Infinite progress is apparently irreconcilable with a fully-completed totality, although Leibniz’s discussion of the qualitative infinite is meant to address these two conflicting demands. Kant, however, sees in the conflict between the imagination’s endeavor and reason’s demand a sign of the disproportion between the sensible and the intellectual within man. This disproportion of the faculties awakens the feeling of the “supersensible” and thus of the sublime. The conflict does not show how imagination and reason *compare* with one another; instead it shows that there must be something strictly *incomparable*. It is in this sense that we can experience the absolute through the *Übertreffen* of all sensory measures.

2. Imagination’s Infinite Progress, the Aesthetic Maximum, and the Sublime

In his discussion of the conflict between the demands of imagination and of reason, Kant claims that the imagination’s striving knows no limit. Even its infinite progress, however, is inadequate to reason’s demand for totality. Our recognition of imagination’s failure awakens a feeling of a “supersensible capacity.” As Kant writes, the *Gebrauch* made by the faculty of judgment for the sake of producing this feeling can be properly termed “schlechthin groß.” The production of the “schlechthin groß” depends upon the

inadequacy of even the imagination's *infinite* progress. Elsewhere, however, Kant claims that the imagination's power is *not* infinite. Instead, it encounters a limit, which Kant calls the "aesthetic maximum." Kant seems to contradict himself here: on the one hand, his argument for the conflict between the demands of imagination and reason depends upon the *infinite* power of the imagination; on the other, he claims that imagination encounters an upper boundary.

He presents his account of the *limitation* of the imagination's power in §26:

Nun gibt es zwar für die mathematische Größenschätzung kein Größtes (denn die Macht der Zahlen geht ins Unendliche); aber für die ästhetische Größenschätzung gibt es allerdings ein Größtes, und von diesem sage ich, daß, wenn es als absolutes Maß, über das kein größeres subjektiv (dem beurteilenden Subjekt) möglich sei, beurteilt wird, es die Idee des Erhabenen bei sich führe und diejenige Rührung, welche keine mathematische Schätzung der Größen durch Zahlen (es sei denn, soweit jenes ästhetische Grundmaß dabei in der Einbildungskraft lebendig erhalten wird) bewirken kann, hervorbringe; weil die letztere immer nur die relative Größe durch Vergleichung mit anderen gleicher Art, die erstere aber die Größe schlechthin, soweit das Gemüt sie in einer Anschauung fassen kann, darstellt. (*KdU*, §26, Ak. 5:251)

The aesthetic estimation of magnitudes encounters "ein Größtes," and Kant calls this an "absolutes Maß." This measure brings with it the idea of the sublime. Kant thus brings the possession of a magnitude *simpliciter* to bear in his explanation of the concept of something that is *schlechthin groß*. Just as only aesthetic comprehension can provide a *Grundmaß*—a unity that is not itself defined through other measures because it derives from the degree of our capacity to grasp a multiplicity in a single intuition—so only the aesthetic estimation of magnitudes can reach a maximum. This maximum, as Kant writes, also stems from the limits of what we can grasp within a single magnitude, for it represents the greatest amount that we can comprehend; the aesthetic "absolute measure"

is thus a specification of the more general concept of an aesthetic *Grundmaß*—a concept which, as we have seen, is required for any estimation of magnitude whatsoever.

But here the conflict clearly emerges between Kant's discussion of the "absolute Maß" and his account of the genesis of the feeling of the absolute out of the conflict between imagination's infinite progress and reason's demand for totality. I will argue, however, that Kant does not contradict himself in claiming both that the imagination demands infinite progress and that the aesthetic estimation of magnitudes reaches a limit. Instead, he is considering two different aspects of the functioning of the imagination: he calls these two aspects *apprehensio* and *comprehensio aesthetica*.

Two kinds of synthesis by the imagination are required to present a *quantum* in intuition: aesthetic apprehension (*apprehensio*) and aesthetic comprehension (*comprehensio*). Kant's account of the two activities required to represent a manifold as a *quantum* in intuition resolves Kant's seemingly contradictory characterizations of the imagination as both progressing infinitely and as reaching a limit. As we have seen, Kant first appears to claim that imagination can progress infinitely, while also stating that the imagination reaches a maximum in the aesthetic estimation of magnitudes. According to the first model, the feeling of the sublime is provoked because the infinite progression of the imagination is never completely given as the totality reason demands. Imagination does not encounter a limit but is nevertheless incapable of satisfying reason. According to the second characterization, however, imagination encounters something that is "groß schlechthin," a largest measure beyond which it cannot go. Reason then demands that imagination presents even greater magnitudes within intuition, and the incapacity of the

imagination to do so awakens the feeling of the sublime. This incompatibility is only apparent, however, because the two models apply to different aspects of the functioning of the imagination. The first applies to apprehension, the second to comprehension. In §2.1, I present Kant's distinction between apprehension and comprehension and show how it reconciles the conflict between these two accounts. But Kant's discussion does not only resolve this difficulty regarding the generation of the feeling of the sublime: it also suggests a novel account of the constitution of the instant (*Augenblick*). In the second part of this section (§2.2), I will consider the account of time implied by Kant's theory of apprehension and comprehension both in the third *Critique* and in the A Deduction of the first *Critique*.

2.1 *Apprehensio, comprehensio* and the generation of the feeling of the sublime

In order for a *quantum* to be “intuitively” taken up into the imagination so that we can then use it either as a measure or as a unit for mathematical estimation through numbers, we must perform two actions: the imagination must engage in an “*Auffassung* (*apprehensio*) und *Zusammenfassung* (*comprehensio aesthetica*)” (*KdU*, §26, Ak. 5:251). While Kant does not describe these two activities of the imagination here, his characterization of the synthesis of apprehension in the first edition of the Transcendental Deduction to the first *Critique* provides an initial indication of their meaning. In this section, Kant writes that a synthesis is necessary to present the manifold of intuition *as* a manifold within a single

intuition.²² Every representation contained in an instant must possess “absolute unity,” so a synthesis is required for a unity of the manifold in intuition: “Damit nun aus diesem Mannigfaltigen Einheit der Anschauung werde, (wie etwas in der Vorstellung des Raumes) so ist erstlich das Durchlaufen der Mannigfaltigkeit und denn die Zusammennehmung desselben notwendig” (A99). In the “Durchlaufen” of multiplicity, the constituents are taken as different elements considered successively, while the “Zusammennehmung” assigns this multiplicity to a single intuition. We will return to this account later and consider the a priori conditions of such a synthesis, but for the moment it is sufficient to note the analogy between these two aspects and the *apprehensio* and *comprehensio aesthetica*. In the synthesis of apprehension, more and more impressions are successively taken in, while the synthesis of comprehension unifies these impressions into a *whole*. A Reflection, approximately contemporaneous with the third *Critique*, confirms this interpretation of apprehension and comprehension in terms of the two aspects of the first *Critique*’s synthesis of apprehension. In this Reflection, Kant describes *apprehensio* and *comprehensio* as the two activities required to present a concept in intuition: “Die Handlung der Einbildungskraft, einem Begriff eine Anschauung zu geben, ist exhibitio. ... Auffassung der Einbildungskraft, apprehensio aesthetica.

²² See Longuenesse’s discussion of this synthesis and its role in the argument of the Deduction in *Kant and the Capacity to Judge*, 36–38. Longuenesse contrasts Kant’s account of the given with that of both the British empiricists and German *Schulphilosophie*: “The manifold of intuition received in the forms of sensibility can be perceived ‘as’ manifold only if an act of synthesis is added to receptivity. Thus, where British empiricists and, after them, the psychology textbooks of German *Schulphilosophie* considered the manifold of simple sensations as given, what Kant considers as immediately given is not a manifold of sensory atoms, but *indeterminate empirical intuitions*; the sensations or impressions constituting its ‘matter’ are perceived ‘as’ manifold only if they are actively *distinguished*” (37). We will return to the question of the “absolute unity” of representations as occupying an *Augenblick* in the second half of this discussion.

Zusammenfassung derselben, *comprehensio aesthetica* (ästhetisches Begreifen), ich fasse das Mannigfaltige zusammen in eine ganze Vorstellung und so bekommt sie eine gewisse Form” (Refl. 5661, Ak. 18:320). Kant thus characterizes the first operation of the imagination, apprehension, as an “Auffassen,” as a “taking up” or processing as such, whereas comprehension is a “Begreifen” or “Zusammenfassen,” a taking-together within a single unit.²³

One possible interpretation of the two types of synthesis in the *Analytic of the Sublime* would relate them to two independent acts capable of measuring magnitude: in apprehension, we would measure by adding successive units, while in comprehension we would increase the size of the very unit of measurement. This interpretation relies upon the passage cited in the previous section in which Kant describes the process of increasing the *Maßstab* (*KdU* §25, Ak. 5:250).²⁴ Such a reading of Kant’s argument, however, seems

²³ This Reflection is also significant in suggesting a connection between *comprehensio* and the imposition of *form*. I will argue that Kant uses “form” here in the same sense as that of the first *Critique*. As will be shown in the second part of this section, these syntheses are required for the manifold to be presented in space and time at all—as well as for the intuitions of space and time themselves.

²⁴ Makkreel interprets Kant as arguing that apprehension and comprehension are two independent possible types of synthesis and claims that they are preceded by another activity in which the fundamental manifold is taken in: “In addition to the immediate prehension (*Fassung*) of the fundamental measure in intuition, Kant distinguishes two activities of the imagination necessary for mathematical measurement: apprehension (*Auffassung*) and comprehension (*Zusammenfassung*). The imagination can use the fundamental measure as a unit to generate a numerical sequence where each added unit is apprehended successively. Or, as it proceeds numerically, the imagination can also construct more encompassing units of measure, as in a scale where ten or even a hundred units may be comprehended as one.” *Imagination and Interpretation in Kant*, 69. Whereas Makkreel claims that there is a simple “grasping” of unity prior to apprehension and comprehension, I argue that these two activities are co-constitutive of a measure. He defends this contention by referring to Kant’s discussion of intensive magnitude in the *Anticipations*: “Aesthetic prehension is the act of grasping the ‘absolute unity’ of a sensation, and therefore must have an intensity that measures instantaneously ‘a degree of influence on sense’ (A166/B208). Aesthetic comprehension by contrast measures what I would call an instantaneous confluence of sense. Whereas aesthetic prehension has as its correlate intensive magnitude as a

to run afoul of an obvious textual point: Kant holds that *both* apprehension and comprehension are required for a *Grundmaß*: “Anschaulich ein Quantum in die Einbildungskraft aufzunehmen, um es zum Maße oder als Einheit zur Größenschätzung durch Zahlen brauchen zu können, dazu gehören zwei Handlungen dieses Vermögens: Auffassung (*apprehensio*) und Zusammenfassung (*comprehensio aesthetica*)” (*KdU* §26, Ak. 5:251). All determinations of magnitude by the understanding require two “aesthetic” acts of synthesis merely in order to constitute a *quantum*. Kant thus implies, as he had in the first *Critique*, that no simples—unities that could enter into composites for the measurement of pluralities—are ever given to the mind. The mind does not first take in simples, add them together, and then combine them into a unity: it cannot be said to take in anything definite at all, anything usable for measurement, prior to running through and combining the manifold of intuition.²⁵

The necessity of both apprehension and comprehension for the formation of a *Grundmaß* provides the first step towards reconciling the two models for the production of sublime feeling. Indeed, Kant specifies that only comprehension reaches a limit. Whereas apprehension can be performed indefinitely, comprehension “gelangt bald zu ihrem Maximum, nämlich dem ästhetisch-größten Grundmaße der Größenschätzung”

measure of *existence*, aesthetic comprehension provides the measure for *coexistence*” (77). Of course, intensive magnitude is not a measure of *existence* at all but of *reality*, which, far from being immediate, is the result of a synthesis of the imagination. Makkreel, in fact, completely ignores that reality is a categorical determination. Though a sensation is a unity, a synthesis is required for it to be posited as having a degree along a continuum. As I will show, there is no pure “grasping” of an “absolute unity” in aesthetic prehension either.

²⁵ This appears to conflict with Kant’s statement, cited above, that as contained in an instant “kann jede Vorstellung niemals anderes als absolute Einheit sein” (A99). It will thus be necessary to consider the context for this claim in more depth and consider the nature of this “unity,” for, as we will see, the multiplicity of the given is a central feature of sensibility for Kant.

(Ak. 5:252). It is therefore comprehension that reaches the “ästhetisch-größten Grundmaße der Größenschätzung.” Kant explains that no matter how far forward the imagination goes in apprehension, it cannot advance beyond a certain magnitude through comprehension, since the “zuerst aufgefaßten Teilvorstellungen” drop out from the synthesized unity once the maximum of comprehension is achieved and apprehension advances.

Kant offers two examples illustrating the interaction between apprehension and comprehension: the first occurs in his description of the imagination’s attempt to capture the magnitude of the pyramids and the second in his discussion of St. Peter’s Cathedral in Rome (*KdU*, §26, Ak. 5:252). In the first case, he cites a remark of the Duke of Rovigo, Savary, that one “den Pyramiden nicht sehr nahe kommen, ebensowenig als zu weit davon entfernt sein müsse, um die ganze Rührung von ihrer Größe zu bekommen.” Kant explains that the pyramids lose their power to impress the mind when seen from too far away, because one can no longer discern the stones that form the parts of the whole. This implies that the feeling of the sublime does not merely arise from an impression of the magnitude of the object beheld but from the relationship within intuition of a particular unit—in this case, the length of the stone—to the whole. The individual stones provide the only intuitive measure with which to compare the size of the pyramid. If they cannot be perceived, then there is no scale with which to measure the pyramid aesthetically, and thus its greatness does not impress itself on the viewer.

The case is more complex when the viewer is too close. In this case, “bedarf das Auge einige Zeit, um die Auffassung von der Grundfläche bis zur Spitze zu vollenden; in

dieser aber erlöschen immer zum Teil die ersteren, ehe die Einbildungskraft die letzteren aufgenommen hat, und die Zusammenfassung ist nie vollständig.” It seems here as though Kant is drawing a contrast between what can be taken in by the eye simultaneously, at a “single glance,” so to speak, and that which requires duration to represent. This reading, however, does not accord with the descriptions of apprehension and comprehension Kant has set out. The mind always requires two actions to present the unity of a multiplicity. Therefore, the single glance theory cannot be correct. Apprehension always requires a succession of impressions in inner sense; comprehension then grasps this successive representation as a unity and attributes the succession of representations as all belonging to an object that exists at a single object in time. Thus, even when I am not conscious of the act of perception as taking time, I have nevertheless performed a complex act of synthesis. While I will return in the second part to the implications of the model of dual syntheses for Kant’s theory of time, this brief remark is sufficient to cast doubt on this interpretation of the example. We can modify the “single glance” reading to account for Kant’s theory of apprehension and comprehension. Since comprehension is needed to perceive an object as present in an instant and comprehension cannot synthesize apprehended manifolds beyond a certain threshold, there is a limit to the size of an object that can be perceived as existing all at once: any taking-in of a manifold requires successive addition of parts and then taking them together as one, but there is a maximum of what can be taken as one. Where comprehension reaches this maximum, we will perceive the duration of time required for successive synthesis.

The feeling of the sublime can only be produced in the viewer when she stands close enough to perceive the stones but far enough away that her synthesis of apprehension does not exceed the limits of what can be comprehended by the imagination, resulting in her perceiving duration. Instead, the viewer must feel aesthetic comprehension pushed to its “maximum”: she must recognize the pyramid as *one* but as one that cannot quite be grasped. The idea that the awakening of the sublime feeling requires both that the subject experience the object as demanding presentation within a single intuition and as exceeding the imagination’s capacities to so represent it becomes clearer in Kant’s second example, in which our inadequacy in perceiving the extent of St. Peter’s Cathedral awakens the feeling of sublimity. Kant is careful to note, however, that we may at first simply be confused by this immensity: it only occasions the feeling of the sublime when the imagination endeavors to represent it as one. Thus, Kant’s claim in the example of the pyramids is that, if we are too close, the imagination will *simply* experience itself as taking time to view the pyramids. To experience the full power of the pyramids, the imagination must attempt to comprehend the apprehended multiplicity *within a single intuition*.²⁶ It is only when the imagination attempts this and fails that the experience of the sublime is provoked.

²⁶ The question then arises concerning the conditions of individuation for intuitions. Although the singularity of intuitions is one of the two criteria differentiating them from concepts (the other is immediacy) (A320/B377), Kant does not devote any attention to the question of what constitutes a single intuition as such. The unity of an intuition is presumably connected to the unity of the object it immediately represents, but this rough indication does not suffice in the present case, because the difficulty lies precisely in representing *one* object in *one* intuition. Despite this uncertainty, however, “a single intuition” can at least be understood through its role: it is capable of providing a single instance for a concept and of counting as an immediate representation of an object.

Furthermore, to experience the limitation of comprehension and thus awaken the feeling of the sublime, the imagination must engage in *aesthetic* rather than merely logical comprehension: aesthetic comprehension requires presentation of the manifold within a single intuition, whereas logical comprehension just involves a mathematical sign standing in for a magnitude of greater size. For the *comprehensio logica* sought by the understanding, the imagination does not need to comprehend ever-greater unities, since the units for mathematical comprehension are of arbitrary size. “Es ist auch in der absichtlichen Zweckmäßigkeit nichts, was die Größe des Maßes, mithin der *Zusammenfassung* des Vielen in eine Anschauung, bis zur Grenze des Vermögens der Einbildungskraft und so weit, wie diese in Darstellungen nur immer reichen mag, zu treiben nötigte” (Ak 5:253–254). As Kant implies here, the unit chosen for logical comprehension need not even be presentable by the imagination in intuition: Kant writes that the mathematical estimation of magnitude can continue indefinitely whether the unit of measure is a foot or the diameter of the earth. The understanding, he suggests, not only does not push the imagination to its limits; it appears to hinder its innate tendency to progress to infinity.

These three elements of Kant’s theory of aesthetic apprehension and comprehension—their joint necessity for the generation of a *Grundmaß*, the contrast between apprehension’s ability to continue indefinitely and comprehension’s limitation, and the restriction of this theory of comprehension’s limitation to aesthetic *comprehensio*—provide the materials to resolve the conflict between the models of continual increase and the achievement of a highest magnitude. Both activities are necessary for a *Grundmaß*. Since apprehension can continue indefinitely while comprehension cannot, both the

imagination's infinite demand—in the form of aesthetic apprehension's attempts to encompass more and more—as well as the constraints of imagination in synthesizing what has been apprehended into a unity are required for the generation of an “aesthetic maximum.”

Kant describes this tension between the demands of apprehension and of comprehension as awakened by the “Stimme der Vernunft.” Instead of leaving aesthetic comprehension behind and resting content with mere logical comprehension, the “Stimme der Vernunft” demands:

Totalität ... mithin Zusammenfassung in *eine* Anschauung und für alle jene Glieder einer fortschreitendwachsenden Zahlreihe *Darstellung* ... und selbst das Unendliche (Raum und verfllossene Zeit) von der Forderung nicht ausnimmt, vielmehr es unvermeidlich macht, sich dasselbe (in dem Urteile der gemeinen Vernunft) als *ganz* (seiner Totalität nach) *gegeben* zu denken. (*KdU*, §26, Ak. 5:254).

The voice of reason does not only insist upon totality but upon the presentation of this totality within a single intuition. While the understanding does not seek any intuitive presentation, reason demands that whatever understanding represents symbolically in a numerical series be *presented within a single intuition*. Anything the understanding judges as a given magnitude, reason claims can be represented in its entirety: whatever is given can be “*ganz ... gegeben*.” This demand, Kant writes in the next paragraph, itself speaks to a supersensible faculty, a “faculty,” that is, that places a demand that exceeds anything that could be presented as a *Maßstab*, since this measure would have to stand in proportion to infinity. The capacity, Kant claims, even to think this demand points to a faculty superior not only to sensibility but “über alle Vergleichung selbst mit dem Vermögen der mathematischen Schätzung.” Kant returns here to his claim that objects in nature

occasion the feeling of sublimity when they generate the idea of infinity. This only occurs when we are confronted with the “Unangemessenheit selbst der größten Bestrebung unserer Einbildungskraft in der Größenschätzung eines Gegenstandes” (Ak. 5:255).

The “voice of reason” can only be heard in the aesthetic estimation of magnitudes. When we determine magnitudes mathematically, nothing awakens this voice, and so there is no sense of the disproportion between progressive infinity and given totality. This disproportion, however, is the condition of sublime feeling. In the aesthetic estimation of magnitudes, the “Bestrebung zur Zusammenfassung” exceeds the “das Vermögen der Einbildungskraft,” and thus we perceive the *Unangemessenheit* of the imagination, even with its *infinite* capacity of apprehension, to comprehend the *Grundmaß* of nature (Ak. 5:255). This *Grundmaß*, Kant explains, would be that of the absolute entirety of nature, but any concept of a totality of infinite progression is incompatible with the conditions of sensible intuition and must lead to the idea of an “übersinnliches Substrat.”²⁷ Now, theoretical reason can, of course, demonstrate the conflict between an infinite *progressus* and a given totality, but such a theoretical argument does not suffice for the feeling of the sublime.²⁸ Kant’s point is that the latter only occurs in the imagination’s striving to present what it itself generates, an ever-increasing series, in a single intuition.

²⁷ The Analytic of the Sublime thus depicts a consequence of the same incompatibility between a demand of reason and the conditions of sensibility that Kant had described in the Transcendental Dialectic of the first *Critique*. This connection provides a first indication of the close relationship between a *dialectic* of theoretical reason and an *analytic* of the faculty of judgment, which will be explored in the final section of the present chapter. For Kant’s general discussion of the transcendental ideas and their relation to totality, see A312/B368–A332/B389.

²⁸ Kant demonstrated this conflict between totality and infinite progression in the mathematical antinomies of the first *Critique*. See A426/B454–A443/B471. This provides, Kant claims, an indirect proof of transcendental idealism, for the dissolution of the antinomy requires the distinction between appearance and the thing in itself. See discussion in footnote 13 of the previous chapter.

Its failure to do so allows it to perceive its own *Unangemessenheit*, which provides its only access to the *Übersinnliches*, to that which exceeds the limitations of the form of infinity proper to sensibility. The introduction of the *Übersinnliches* concludes Kant's exposition of the development of sublime feeling through the tension between the syntheses of apprehension and comprehension.

2.2 Simplicity and the *Augenblick*

Kant hints that his discussion of the conflict between the capacities of apprehension and comprehension has further significance for his account of the syntheses required to perceive objects as occurring in space and time. In §27 of the mathematical sublime, Kant claims that both a *progressus* and a *regressus* are required for impressions to be perceived as simultaneous.²⁹ “Messung eines Raums (als Auffassung) ist zugleich Beschreibung desselben, mithin objektive Bewegung in der Einbildung und ein Progressus; die Zusammenfassung der Vielheit in die Einheit nicht des Gedankens, sondern der Anschauung, mithin des Sukzessiv-Aufgefaßten in einen Augenblick, ist dagegen ein Regressus, der die Zeitbedingung im Progressus der Einbildungskraft wieder aufhebt und das *Zugleichsein* anschaulich macht” (Ak. 5:258–59). He explains that the measurement of space—a “description” or “taking up” of the manifold—is a *progressus*, a successive

²⁹ For an analysis of this passage, see Rudolf Makkreel, “Imagination and Temporality in Kant's Theory of the Sublime,” *Journal of Aesthetics and Art Criticism* 42 (1984): 65–82. Like the present analysis, Makkreel places the theory of temporality in the sublime in relation to the Anticipations of Perception, though he argues elsewhere for the superiority of the sublime's presentation: “With the further development of the theory of the imagination in the third *Critique*, the intuition of multiplicity is more readily conceivable through the idea of an imagination annulling the linear form of time.” *Imagination and Interpretation in Kant*, 76.

addition of elements. Apprehension is thus characterized as a unidirectional, linear movement of the imagination in time. The movement of comprehension, on the other hand, reverses this direction: it is a *regressus* that “undoes” the forward-directed movement of time in the act of apprehension and represents the apprehended manifold as simultaneous, as given in an instant. Two consequences follow from this initial description: first, we can see that the activities of apprehension and comprehension are required for the experience of objects in space and time.³⁰ They are thus what Kant calls “transcendental syntheses of the imagination.”³¹ The second consequence implies that apprehension and comprehension themselves occur in inner sense. Since Kant calls apprehension a progression and comprehension a regression, there must be a linear, oriented form—some time—in which these activities occur. But if these syntheses set out the very requirements for spatiotemporal experience and thus for the orientation of time and space themselves, then how can they occur within time? On the other hand, however, they must occur within time if they are to have oriented directions. What, in

³⁰ This implies that animals—who do not have intellectual capacities (*Anthropologie*, §1, Ak. 7:127)—do not have “experience of objects in space and time.” Kant does claim, however, that animals are *acquainted* with objects in space and time (See *Jäsche Logik*, §10, Ak. 9:64–65). One recent response to this problem is to claim that Kant is not claiming in the Deduction that intellectual activity is required for perception of objects but for discursive cognition. I would like to thank Colin McLear for this point. See his “Kant on Animal Consciousness,” *Philosophers’ Imprint* (forthcoming).

³¹ One possible objection to this account would be that apprehension and comprehension are only required to form judgments of magnitude regarding objects and thus are only applicable to appearances that have already been schematized according to the categories. According to this line of interpretation, apprehension and comprehension would only become relevant with regard to the Principles and would presuppose the results of the Deduction and Schematism. This objection is mistaken, however, in seeing the application of the Principles as occurring at a later stage than the Deduction and Schematism. The Principles do not propose forms of synthesis that are added onto the more fundamental kinds of synthesis, but, in Longuenesse’s terms, “discursively translate” the imaginative syntheses described in the Deduction and Schematism—in other words, they are the rules for the formation of judgments that correlate to the rules by which we organize spatiotemporal perception.

other words, is the relationship between the transcendental syntheses that condition the possibility of the experience of objects and the time that is required for these very syntheses to be performed? To approach Kant's theory of *progressus* and *regressus* in this passage, we will first examine the background of his aforementioned account of the syntheses of apprehension in an intuition, reproduction in imagination, and recognition in a concept in the A Deduction of the first *Critique*.³²

Kant begins the 1781 version of the Deduction of the Pure Concepts of the Understanding with a preliminary exposition of three kinds of synthesis that are required for experience of objects, the so-called "subjektive Quellen, welche die Grundlage a priori zu der Möglichkeit der Erfahrung ausmachen" (A97).³³ In the first three numbered sections of the Deduction, he ascends from that which seems to be immediately given in intuition to that which has been reflected under concepts, ultimately arguing that the very unity of the object as any thing whatsoever = X presupposes the unity of

³² See Makkreel's informative comparison of Kant's position in the first *Critique* and his introduction of a regress in the sublime in *Imagination and Interpretation in Kant*. Makkreel asks whether this regress amounts to a "violation of the critical framework" and answers in the negative: "I would argue that the regress of the imagination does not annihilate time as such, but merely suggests the possibility of negating the mathematical or linear form of time" (73). In particular, Makkreel uses Kant's definition of the instant as a limit to the temporal continuum in the Anticipations to suggest that "the regress of the imagination may be interpreted to limit time rather than transcend it, so that the regress involves, in Schiller's words, 'annulling time within time'" (74).

³³ Kant's discussion of these "subjektive Quellen" is far more extensive in the first edition of the Deduction. In his revised presentation of the argument in 1787, Kant condenses his account, considering only a single form of "Verbindung" (see §15, B129–131). While he shifts his emphasis in the second edition, his own statements in the B Preface (B xxxviii) indicate that he did not change his position. The fuller exposition in the first edition thus justifies using it as the central text in considering these syntheses. Heidegger provides a careful analysis of these sections in *Kant und das Problem der Metaphysik* (Frankfurt: Klostermann, 1951), where he describes the dependence of all three syntheses on the transcendental imagination. In his reading, these three syntheses generate the temporal modes of present, past, and future. See particularly *Kant und das Problem der Metaphysik*, §33, 176–188.

transcendental apperception. Each stage—intuition, imagination, the concept—requires a pure synthesis that conditions the very possibility of experience; moreover, Kant shows that each synthesis depends upon the possibility of the subsequent synthesis. Kant’s argument is directed throughout against an empiricist account of sense data.³⁴ According to Hume, when I perceive an object, my senses take in simple impressions arranged in a particular way. We are presented with images composed of points, and we only form our ideas of space and time through abstraction from these pointillist pictures. For example, when we look at a table, our senses give us “impressions of colour’d points dispos’d in a certain manner.”³⁵ To this, Kant replies that no intuition ever presents us with simples, whether arranged table- or otherwise. A central thread of Kant’s presentation thus lies in the claim that the mind does not take in an image composed of points “disposed” in a

³⁴ In his dissertation, “Kant on Concept and Intuition” (University of California at Los Angeles, 1985), Derk Pereboom argues that Kant does in fact hold a Humean model of atomistic sense data. He explains the model in the following terms: “A long tradition of atomism, which is historically linked to empiricism, sought to explain complex things in terms of smaller parts and particles and relationships between them. ... Although such a model had influence in psychology for centuries, Hume was the first philosopher who fairly self-consciously developed a psychological theory along these lines Our naive, ordinary, experience is supposed to be explained in terms of atomistic, relatively disorganized impressions and ideas and relations of association among them. Kant, I want to suggest, had the same model in mind. To be sure, he attempts to refute Hume’s notion that the principles of association suffice to explain the organization of our mental representations ... but he nevertheless adopts Hume’s starting point for explanation. Kant also begins his explanatory account of our conscious experience by positing a mental world of atomistic, discrete, momentary, disorganized representations” (“Kant on Concept and Intuition,” 29–30). Against this, I would like to claim that Kant shares no such starting point with Hume and that this divergence in initial perspectives can be seen by contrasting their accounts of the nature of space. It seems to me a weakness of Pereboom’s account that—as he concedes—it renders a priori *intuitions* mysterious: “it is not clear whether Kant thinks that pure intuitions are passively received, but he does hold that conscious pure intuitions also contain a manifold that has been synthesized What the manifold of a pure intuition might be like is, however, extremely difficult to imagine. Possibly this manifold consists of spatial and temporal points, but it is not clear that the notion of unorganized spatial and temporal points makes any sense” (30).

³⁵ David Hume, *A Treatise of Human Nature*, ed. L.A. Selby-Bigge (Oxford: Clarendon Press, 1896), I, ii, §3, 34.

certain way but that any intuition contains a multiplicity that can never be divided into ultimate atomic constituents. Despite the centrality of this thesis to the argument of these sections, however, Kant appears to contradict himself, for, in his discussion of the synthesis of apprehension, he claims that, as contained in an instant, each representation (*Vorstellung*) can be nothing other than absolute unity. As already seen at the beginning of this chapter, this statement represents one pole of Kant's conception of temporality, and, along with it, his theory of the relationship between simplicity and multiplicity. Against the background of his description of apprehension and comprehension, it is now possible to examine this claim.

Kant's statement regarding the unity of what can be contained in an instant has two aspects that seem to stand in tension with other central commitments: first, as mentioned at the beginning of the chapter, it appears to rely upon a theory of time as composed out of instants, which would contradict Kant's many statements that time is a *quantum continuum*, a single infinite whole (for instance, at B48) and that instants are mere limits rather than constituents of time;³⁶ second, it implies an atomism of sense data, apparently conceding to the empiricist that the mind receives simple impressions.³⁷ Both

³⁶ De Vleeschauwer points out that Kant's claim that the instant is the limit of time, rather than a component, implies that there is never an absolute simple in time: "Toutefois, cette explication ne se maintient qu'avec cette conception du moment. Si l'on conçoit le moment comme une limite extrême et jamais atteinte, il est clair qu'aucun moment du temps réel ne répond exactement au moment idéal et qu'il ne postule, dès lors, plus l'unité absolue de l'impression affectante." *La déduction transcendentale*, 2:245. De Vleeschauwer's distinction between "real" and "ideal" time confuses matters, however: even as "ideal," as pure intuition, a single instant cannot be presented. Perhaps, however, by ideal, de Vleeschauwer means "abstract" or postulated at the limit of an infinite series.

³⁷ Longuenesse argues that Kant cannot mean "simplicity" by "absolute unity" because this would "attribute[] to Kant an atomism of sense data which in my opinion is quite foreign to him." *Kant and the Capacity to Judge*, 39. To this, Longuenesse contrasts her own reading of "absolute unity" as "indeterminate." I agree with Longuenesse here that we represent the

difficulties rest upon Kant's doctrine of time as the formal condition of inner sense and the relation between this formal condition and the synthesis required to constitute intuitions at all.³⁸ Because of the importance of the challenge these difficulties seem to pose, the claim that only unity can be presented in an instant needs to be examined within the context of the argument of the paragraph, but before doing so, it is worth noting a remark preceding Kant's preliminary exposition of the threefold synthesis. In the initial, unnumbered section of the Deduction, immediately after introducing the claim that the pure concepts of the understanding must be conditions of the possibility of experience if we are to have any knowledge of such concepts, he offers a description of representation that appears to be disconnected from the surrounding context:

Wenn eine jede einzelne Vorstellung der andern ganz fremd, gleichsam isoliert, und von dieser getrennt wäre, so würde niemals so etwas, als Erkenntnis ist, entspringen, welche ein Ganzes verglichener und verknüpfter Vorstellungen ist. Wenn ich also dem Sinne deswegen, weil er in seiner Anschauung Mannigfaltigkeit enthält, eine Synopsis beilege, so korrespondiert dieser jederzeit eine Synthesis und die *Rezeptivität* kann nur mit *Spontaneität* verbunden Erkenntnisse möglich machen. Diese ist nun der Grund einer dreifachen Synthesis, die notwendiger Weise in allem Erkenntnis vorkommt: nämlich, der *Apprehension* der Vorstellungen, als Modifikationen des Gemüts in der Anschauung, der *Reproduktion* derselben in der Einbildung und ihrer *Rekognition* im Begriffe. (A97)

Kant thus motivates the threefold synthesis required for cognition through a claim about the inherent connection of all representations. He starts from the premise that cognition is a whole (*Ganzes*) of linked and connected representations. Kant then argues that if

manifold only “confusedly,” but I think this indicates that Kant's references to this manifold are merely heuristic in nature. The details of this proposal will emerge in the subsequent discussion of A99 as a proposing a merely hypothetical simple impression.

³⁸In this sense, we are confronted with the same problem regarding the articulation of sensible and discursive conditions that we encountered in the discussion of the Schematism in the previous chapter. Once again, time's dual determination as both “sensible and intellectual” is at issue.

there were no connections among representations themselves, cognition could not “arise” (*entspringen*) from these representations: there would be a gap, a leap or *Sprung*, from representations to cognition and thus the possibility of cognition would become inexplicable. Representations must, as such, bear relations to other representations, so they are always presented as linked to other representations. Kant calls this connection among representations in intuition a *Synopsis* and claims that this link in receptivity must always correspond to a spontaneous power of cognition making cognitions possible.³⁹

³⁹ Kant mentions synopsis only twice: once in the above-cited passage and once at A94. Heidegger interprets synopsis as rooted in the pure power of the imagination and distinguishes synopsis from synthesis because of the different way in which multiplicity is contained within a whole: “Die Verwurzelung der reinen Anschauung in der reinen Einbildungskraft wird vollends deutlich, wenn wir dem Charakter des in der reinen Anschauung Angeschauten nachfragen. ... Das in der reinen Anschauung Erblickte ist ein in sich einiges, obzwar nicht leeres Ganzes, dessen Teile immer nur Einschränkungen seiner selbst sind. Dieses einige Ganze muß sich nun aber gerade im vorhinein bezüglich dieses Zusammen seiner meist unabgehobenen Mannigfaltigkeit erblicken lassen. Die reine Anschauung muß ursprünglich einigend, d. h. Einheit gebend, die Einheit erblickend. Kant spricht daher mit Recht hier nicht von einer Synthesis, sondern von der ‘Synopsis’. Die Ganzheit des in der reinen Anschauung Angeschauten hat nicht die Einheit einer Allgemeinheit des Begriffes. Die Einheit der Anschauungsganzheit kann daher auch nicht der ‘Synthesis des Verstandes’ entspringen. Sie ist eine im Bildgebenden Einbilden im vorhinein erblickte Einheit. Das ‘Syn’ der Ganzheit von Raum und Zeit gehört zu einem Vermögen der bildenden Anschauung. Die reine Synopsis ist, wenn sie das Wesen der reinen Anschauung ausmacht, nur in der transcendentalen Einbildungskraft möglich; das um so mehr, als diese überhaupt der Ursprung alles ‘Synthetischen’ ist. ‘Synthesis’ muß hier durchaus so weit gefaßt werden, daß sie die Synopsis der Anschauung und die ‘Synthesis’ des Verstandes umgreift.” *Kant und das Problem der Metaphysik*, 142. In one of the few additional discussions of synopsis, Wayne Waxman argues that sensations are the “primary matter of representations” and attributes “utter, absolute formlessness” to them. Waxman, *Kant’s Model of the Mind: A New Interpretation of Transcendental Idealism* (Oxford: Oxford University Press, 1991), 223. As we have seen, however, sensations cannot exist as simply material, since we can know a priori that they are subject to the principle of intensive magnitudes. Waxman’s view commits him to the position that synopsis is in no way the product of the imagination but is “the sheer capacity for manifold sensory affection” in receptivity. He offers several possibilities for interpreting this claim: first, he suggests that it is conceivable that the faculty of sense might be incapable of rendering its affection as *manifold*, so it requires “a specially constituted receptivity” to do so. Second, he raises the possibility that synopsis might be “a solution to the problem of the *identity* of a sensibility” but admits that this suggestion is also unsatisfactory, because any of the plausible ways of conceiving of the means by which identity is achieved (succession, juxtaposition, composition, and position) would attribute an activity of the imagination to it (224). Waxman is thus reduced to claiming that synopsis is a

This passage implies that representations cannot themselves be simple, since if a multiplicity of representations were merely a collection of simples, then there would be no necessary link among these representations. For representations to have such a necessary connection, they must possess some property in common with other representations. Whatever is simple cannot be inherently connected to something else, since it would only contingently have relational properties: all its necessary properties would be intrinsic. This remark then provides additional evidence for the importance of Kant's rejection of the model of sensible impressions as absolutely simple atoms, for such a model would contradict a necessary condition of the threefold synthesis.

Within the context of this introductory remark, Kant's statement that every representation must be an absolute unity becomes even more puzzling. Why would he claim this a mere page after grounding his entire account of synthesis upon the inherent connectedness of all representations in cognition? He makes this statement in the course of his argument that the representation of a manifold through inner sense requires the synthesis of apprehension. In the first paragraph of the section, he notes that *all* representations must belong to inner sense. He then shows that this presupposes an act of synthesis:

Jede Anschauung enthält ein Mannigfaltiges in sich, welches doch nicht als ein solches vorgestellt werden würde, wenn das Gemüt nicht die Zeit, in der Folge der Eindrücke auf einander unterschiede: denn *als in einem Augenblick enthalten*, kann jede Vorstellung niemals etwas anderes, als absolute Einheit sein. Damit nun aus diesem Mannigfaltigen Einheit der Anschauung werde, (wie etwas in der Vorstellung des Raumes) so ist erstlich das Durchlaufen der Mannigfaltigkeit und denn die Zusammennehmung desselben notwendig, welche Handlung ich die *Synthesis der Apprehension* nenne, weil sie gerade zu auf die Anschauung gerichtet ist,

bare potential. For Waxman's denial of Heidegger's claim, see *Kant's Model of the Mind*, 243 fn. 17.

die zwar ein Mannigfaltiges darbietet, dieses aber als ein solches, und zwar *in einer Vorstellung* enthalten, niemals ohne eine dabei vorkommende Synthesis bewirken kann. (A99)

First, it is important to note that this perplexing statement about absolute unity occurs in the context of an argument premised on the claim that every intuition contains a multiplicity. Since objects are only presented to us in intuition, whatever Kant's claim about absolute unity might mean, it should not be taken to imply that we have simple perceptions of objects. Indeed, Kant reverses this: since every intuition contains a manifold, and a single instant could only contain a unity, every intuition must contain a multiplicity of instants. But if every intuition contains a multiplicity, then the constitution of intuition itself depends upon a synthesis through which the multitude is taken up and represented as a multitude. The central question, however, is whether this multitude depends upon a simple, given in a single instant. The paragraph begins by laying out a claim regarding the condition for the representation of every intuition as containing a multitude: the mind must distinguish time in the succession of impressions.⁴⁰ If the mind did not impose a temporal succession, there would be no grounds for the multitude to be *differentiated*, because the only grounds to distinguish multitude from unity are provided by the form of intuition. Placing emphasis on the first clause of the sentence in question opens up a new possibility for reading the second half, which would not commit Kant to the claim that we ever have simple representations contained in an instant—a claim which would violate both the multiplicity requirement and his theory of time. According to this

⁴⁰ The term “unterscheiden” lends support to Longuenesse's reading of “absolute Einheit” here as undifferentiated unity. See *Kant and the Capacity to Judge*, 36–38 and 38–39 fn. 10. This reading is compatible with my own but is independent from it, since I interpret Kant as not being committed to our ever having representation contained in an instant.

suggestion, in the second half of this sentence Kant is merely spelling out a consequence of his fundamental doctrine concerning the dependence of multiplicity upon the form of inner sense: if a representation is contained within a single instant, there is no way for a multiplicity to be discerned in it, because there is nothing that could distinguish the multiple elements. Since time is the form of inner sense—that which allows for the presentation of multiplicity as such—time is necessary to distinguish the sequence of impressions. Kant is not claiming here that time is composed of simple instants that themselves contain atomistic representations⁴¹ but, rather, asserting the incompatibility between the multiplicity of intuition and a simple instant. Kant thus presents a counterfactual when he asks us to imagine a simple, disconnected representation: he is in no way committed to the existence of such simples. The passage is thus consistent with a thoroughgoing rejection of the empiricist model of multiplicity as formed by operations of the mind upon simple, atomic sense data. Moreover, it does not imply that the temporal sequence is composed of such simple parts but, instead, provides indirect evidence for Kant's repeated claim that time is first given as a whole and instants are mere limits formed by divisions upon this whole. The suggested reading of the clause as presenting something hypothetical before rejecting it is also strengthened by Kant's

⁴¹ As Makkreel assumes in his discussion of this passage in *Imagination and Interpretation in Kant*, 73. Makkreel does attempt to render these two doctrines compatible by pointing out that while Kant uses the term “Mannigfaltigkeit” in the first *Critique*, he writes of a “Vielheit” in the third. Makkreel somehow views this, however, as contributing to the “indeterminacy” of the parts of the multiplicity perceived in the instant of aesthetic regress. According to Makkreel, because the representation of simultaneity in aesthetic comprehension is merely indefinite, it does not require the application of the categories over time that would be necessary for a definite, conceptual determination. Makkreel does point out the affinity between this passage in the third *Critique* and the representation of a magnitude as a unity in the Anticipations but views the latter as a deviation from the argument of the first *Critique* (75–77).

further remarks on the necessity of an a priori synthesis for the representations of time and space.

In the following paragraph, Kant argues that a priori representations of space and time also require a synthesis of apprehension and thus that this synthesis is a condition of all cognition:

Diese Synthesis der Apprehension muß nun auch a priori, d.i. in Ansehung der Vorstellungen, die nicht empirisch sein, ausgeübt werden. Denn ohne sie würden wir weder die Vorstellungen des Raumes, noch der Zeit a priori haben können: da diese nur durch die Synthesis des Mannigfaltigen, welches die Sinnlichkeit in ihrer ursprünglichen Rezeptivität darbietet, erzeugt werden können. Also haben wir eine reine Synthesis der Apprehension. (A99–100)

Kant does not describe two separate stages whereby representations of space and time are first present in intuition and then synthesized to form concepts, but rather a synthesis necessary for us to have a priori representations of space and time at all.⁴² These arise from the manifold provided by “sensibility in its original receptivity.”⁴³ Similarly, in a footnote to §26 of the second edition of the Deduction, Kant describes the difference between a form of intuition and a formal intuition. The latter requires unity to be added to the

⁴² One might object that at A99–100 and in the B160 footnote, Kant is only claiming that synthesis is required for the *concepts* of space and time, not for the forms of space and time. In the footnote to B160, Kant does indeed refer to synthesis as the condition of the possibility of “Begriffe von Raum und Zeit,” but his characterization of the results of this synthesis as generating space and time “als Anschauungen” casts doubt on this interpretation. Moreover, Kant’s claim at A99–100 that the original receptivity of sensibility offers only a manifold suggests that synthesis is necessary even for *intuitions* of space and time. This point, however, is contested in the literature. For an alternative reading of these passages, see Colin McLear, “Kant on the Nature of Perceptual Experience” (manuscript). McLear argues that Kant has strong reasons for denying that synthesis is required to form intuitions of space and time as infinite wholes: since our discursive capacities—and hence presumably our abilities to synthesize—are finite, it is not clear how we could perform any infinite synthesis, so we should interpret Kant as holding that space and time are presented to intuition as infinite in a more immediate way. Nevertheless, Kant’s discussions in both the A and B editions of the Deduction seem to favor the view that synthesis is required for formal intuitions.

⁴³ Longuenesse characterizes this as “a ‘pure form’ of manifoldness.” *Kant and the Capacity to Judge*, 38.

representation: “Diese Einheit hatte ich in der Ästhetik bloß zur Sinnlichkeit gezählt, um nur zu bemerken, daß sie vor allem Begriffe vorhergehe, ob sie zwar eine Synthesis, die nicht den Sinnen angehört, durch welche aber alle Begriffe von Raum und Zeit zuerst möglich werden.” The unity allows space and time to be given “als Anschauungen” (B160–161). Space and time can only be constituted as intuitions through the unity of the manifold, the taking up of the pure manifold *as* manifold, and the holding together of this manifold in a single act: space and time are only *given* as a priori intuitions, as manifolds that are representable as a unity containing multiplicity, because the understanding determines sensibility prior to any perception of multiple elements. Perceptual elements, in turn, can only be experienced as such because of this a priori synthesis that determines space and time as infinite wholes. The fundamental kind of synthesis required for the constitution of formal intuitions does not operate upon a collection of instants but, instead, first renders the collection possible by providing a unified frame in which separate elements can appear. Thus, although Kant describes the pure synthesis of apprehension required for the generation of space and time as a priori intuitions, he does not base this account on a composition of individual instants in the A Deduction. Instead, he describes the conditions under which our activity of summation is rendered possible. Throughout the first *Critique*, “Augenblicke sind nur Grenzen” (A169/B210). Only in his reconsideration of apprehension and comprehension in the *Analytic of the Sublime* does Kant begin to provide an account of these limits. The theory of the instant Kant sketches in the third *Critique* reveals that the conflict between

progressus and *regressus* can be felt—he describes the severing of the continuity of inner sense as a violation of the *quantum continuum* in its condensation into an *Augenblick*.

In a passage concerning the measurement of space in his discussion of the quality of judgments of the mathematical sublime, Kant applies his account of the two aspects by which a *quantum* is taken up into the imagination to the spatiotemporal order itself. Unlike in the first *Critique*, Kant is concerned here with making the “simultaneous” intuitable; he is concerned with the condensation of what has been successively apprehended into a single instant and thus the presentation of this instant as such:

Messung eines Raums (als Auffassung) ist zugleich Beschreibung desselben, mithin objektive Bewegung in der Einbildung und ein Progressus; die Zusammenfassung der Vielheit in die Einheit nicht des Gedankens, sondern der Anschauung, mithin des Sukzessiv-Aufgefaßten in einen Augenblick, ist dagegen ein Regressus, der die Zeitbedingung im Progressus der Einbildungskraft wieder aufhebt und das *Zugleichsein* anschaulich macht. Sie ist also (da die Zeitfolge eine Bedingung des inneren Sinnes und einer Anschauung ist) eine subjektive Bewegung der Einbildungskraft, wodurch sie dem inneren Sinne Gewalt antut, die desto merklicher sein muß, je größer das Quantum ist, welches die Einbildungskraft in eine Anschauung zusammenfaßt. (*KdU*, §27, Ak. 5:258–259)

In this passage, Kant describes a process through which the simultaneous perception of the many—the defining characteristic of spatial perception—is itself *generated* out of the two aspects of temporal synthesis, apprehension and comprehension. He thus offers an account of the perception of objects in space on the basis of syntheses occurring in time. The two activities of successive apprehension and simultaneous comprehension do violence to inner sense itself, because representing something as spatial presents it not as successively apprehended but as given all at once. It thus represents it as occurring in an “instant,” which is only a limit to the temporal form of experience.

Kant starts the passage by describing the measurement of a space—an activity that would be performed by outer intuition—but he describes this process using the linear, one-dimensional inner sense: the measurement of a space is a *Beschreibung*, a successive tracing, of this space. This subjects outer intuition to the conditions of its description by inner intuition. *Beschreibung*, however, merely constitutes the first of the two required activities for the perception of a *quantum*. A second, regressive activity by which the manifold is represented as if in one *Augenblick* is necessary. When we are concerned with the pure synthesis of the many in the one, the *Augenblick* must be the unity in which the multiplicity is contained. In other words, in order to fulfill the pure synthesis Kant briefly describes in the first *Critique*, he must, it seems, violate the structure of time as first given in an infinite whole. There must be an instant that is made intuitable as the unity of these successive moments in time. It is for this reason that Kant describes comprehension as a merely subjective movement of the imagination that does violence to inner sense. He thus proposes that there can be mental states—feelings—of what cannot be presented as experience of an object. In the moment in which the many is condensed into the one, something is presented—an *Augenblick* that can only be felt because it does not meet the conditions required for cognition of objects.

The two activities of apprehension and comprehension thus constitute a two-fold process in which the progressive sequence of time is always undone, annihilated—*aufgehoben*—by the comprehensive function of the imagination that exercises *Gewalt* upon the condition of inner sense. This annihilation of the successive apprehension of time, this freezing into the limit that constitutes an instant, is what allows multiplicity to be

presented as such in the *Augenblick*. The regress of imaginative comprehension holds fixed the multiple that can otherwise only be presented in time and represents it as simultaneous within a single instant. The central term for this holding fixed, a term that remains undefined in this section, is *Gewalt*—the violence done to inner sense through the movement of the imagination. While Kant invokes *Gewalt* in the mathematical sublime without any introduction, it is one of the two terms defined at the start of the dynamic sublime. He opens his description of the second form of the sublime by writing: “Macht ist ein Vermögen, welches großen Hindernissen überlegen ist. Ebendieselbe heißt Gewalt, wenn sie auch dem Widerstande dessen, was selbst Macht besitzt, überlegen ist. Die Natur im ästhetischen Urteile als Macht, die über uns keine Gewalt hat, betrachtet, ist dynamisch-erhaben” (*KdU*, §28, Ak. 5:260). Applied to the relation of the faculties in the mathematical sublime, this *Gewalt* would then consist in a capacity of the imagination that is superior to the forces of resistance of inner sense. Inner sense obstructs the presentation of simultaneity, of the gathering of the temporal manifold into a single instant, but it is overcome by a superior capacity. This reference to Kant’s definition of “Gewalt” in the section on the dynamical sublime also reveals a surprising aspect of the relationship between these two sections: in the dynamical sublime, nature exerts a power that does not exercise violence over us, while in the mathematical sublime, one faculty—the movement of the imagination—does violence to another, inner sense. As already mentioned, however, instants are the limits of the temporal continuum, so the function of the violence done to inner sense is to expose the limit as such. *Gewalt* allows us a feeling of limitation that constitutes the *Augenblick*.

3. The Complex Pleasure of Infinite Judgment

Although the judgment of the sublime arises from a feeling of limitation, the connection between the sublime and limitlessness is far more conspicuous: the subject feels overwhelmed by the seemingly infinite in extent or power. In the second paragraph of his introduction to the *Analytic of the Sublime*, Kant contrasts the objects that provoke judgments of beauty and sublimity through their distinct relations to form. According to Kant, form consists in limitation, while formlessness inheres in the lack thereof: “Das Schöne betrifft die Form des Gegenstandes, die in der Begrenzung besteht; das Erhabene ist dagegen auch an einem formlosen Gegenstande zu finden, sofern *Unbegrenztheit* an ihm oder durch dessen Veranlassung vorgestellt und doch Totalität derselben hinzugedacht wird” (*KdU* §23, Ak. 5:244).⁴⁴ Beautiful objects are enclosed within

⁴⁴ The meaning of “Form” here—as in the third *Critique* as a whole—is puzzling. Prima facie Kant’s use of “form” in this passage seems incompatible with his definition of the term in the first *Critique*, where form is that which allows the manifold in appearance to be ordered in particular relations (A20) and where the forms of all experience are shown to be space and time. This definition would exclude the possibility of having any experience of a formless object, since form is a condition of the presentation in any intuition at all. In the Introduction to the third *Critique*, Kant uses the term “form” to describe a particular property of an object of intuition, rather than an aspect of the faculty of intuition itself, as in the first *Critique*: “Wenn mit der bloßen Auffassung (*apprehensio*) der Form eines Gegenstandes der Anschauung, ohne Beziehung derselben auf einen Begriff zu einem bestimmten Erkenntnis, Lust verbunden ist: so wird die Vorstellung dadurch nicht auf das Objekt, sondern lediglich auf das Subjekt bezogen Denn jene Auffassung der Formen in die Einbildungskraft kann niemals geschehen, ohne daß die reflektierende Urteilskraft, auch unabsichtlich, sie wenigstens mit ihrem Vermögen, Anschauungen auf Bezgriffe zu beziehen, vergliche” (Ak. 5:189–190). Here, form appears to be a property of an object of intuition that can be “apprehended” without subsuming it under concepts. The power of the imagination apprehends these forms, although, Kant writes in the second sentence, this activity necessarily involves a comparison by the reflective power of judgment of these forms with concepts. “Form” retains an affinity to its use in the first *Critique*, since it still relates to configurations of intuitions themselves that are pre-conceptual. Indeed, it seems that Kant may have in mind something like the spatiotemporal relations of objects. In this sense, objects might be “formless,” not because they would not be *in* space and time, but because

borders, and their beauty results from their very limitation; the sublime, on the contrary, is evoked by objects that are represented as unlimited and which nevertheless lead to the thought of totality. Of course, the representation of a lack of limitation—an apparent double negation of unclear status—in the sublime does not imply the irrelevance of limits. On the contrary, it reveals the mutual dependence of limitation and the infinite in the generation of the sublime: confronted with an object that seems to place infinite demands on the subject, an object that appears to be lacking in the limitation that would reassure the subject of the congruity of her faculties to the demands of nature, the subject feels her own limitations and, in this feeling, recognizes another, greater capacity within herself.⁴⁵ Even this schematic account of limitation and limitlessness shows the complexities of the relation between these contraries. Indeed, it only seems possible to evoke the one through the other. This requires us to investigate the type of negation at work in the sublime. In addition, the very concept of a limit (*Grenze*) renders the form of negation even more complex: this concept draws a boundary between what can be positively affirmed and what lies beyond the sphere of affirmation.

they might appear not to be bounded by space and time: they might appear limitless. Interpreting “form” as the spatiotemporal relations of objects in intuition would thus clarify the relationship Kant posits between form and limitation.

⁴⁵ It is this “Wechselbestimmung des Endlichen und Unendlichen” in the sublime that leads Hegel to claim that Kant’s sublime is “der Ausdruck des Widerspruchs” and therefore a merely “schlechte Unendlichkeit.” G.W.F. Hegel, *Wissenschaft der Logik*, in *Werke*, ed. Eva Moldenhauer and Karl Markus Michel (Frankfurt am Main: Suhrkamp, 1970), 5:262. In his analysis of the sublime in Kant and Hegel, Alessandro Bertinetto argues that despite his condemnation of Kant’s sublime, “paradoxe Weise scheint Hegel aber gerade den Begriff des Erhabenen zu einem der zentralen Begriffe seiner Philosophie der Kunst zu erheben.” Bertinetto, “Negative Darstellung. Das Erhabene bei Kant und Hegel,” *Internationales Jahrbuch des Deutschen Idealismus*, 4 (2006): 124–151 at 142–143.

The form of negation at work in Kant's account of the relation between *Grenzen* and *Unbegrenztheit* recalls and elaborates upon his discussions of infinite judgment in the first *Critique* and in his lectures on logic—a form of judgment that partakes of some of the characteristics of both positive and negative judgments. In his table of judgments in the first *Critique*, Kant delineates three types of quality that a judgment can possess (A70/B95): judgments can be affirmative, negative, or infinite.⁴⁶ Like affirmative judgments—which have the form ‘A is B’—the copula in an infinite judgment is positive; the predicate, however, is negated, so infinite judgments take the form ‘A is non-B’ or another prefix designating privation such as *im-*, *a-*, or *un-*.⁴⁷ In general logic, which merely considers the form of judgments, Kant writes, infinite judgments are correctly counted as affirmative, but in transcendental logic—which considers the content of a predicate—infinite judgment must be classified as a separate form of judgment. Kant uses as his example the judgment ‘The soul is not-mortal.’ This judgment differs, he writes,

⁴⁶ Kant adopts the Aristotelian term “quality” as the logical form subsuming positive and negative judgments. Kant's threefold division into positive, negative, and infinite judgments stems from an interpretation of Aristotle's division of the quality of judgments: “In Aristotle judgments are divided with respect to quality into two types, the affirmative and the negative, of which the propositions ‘A is B’ and ‘A is not B’ are the respective examples. But under affirmative judgment Aristotle mentions two other types of judgments, which, though affirmative in quality, are negative in meaning. First, a proposition in which the predicate is what he calls a privation ..., such as the terms ‘blind’ ... and ‘toothless’ Second, a proposition in which the predicate is what Aristotle calls an indefinite term ..., but which through Boethius has been known in the history of philosophy as an infinite term (*nomen infinitum*), as, for instance, the term ‘not-just’ in the proposition ‘the man is not-just.’” H. A. Wolfson, “Infinite and Privative Judgments in Aristotle, Averroes, and Kant,” *Philosophy and Phenomenological Research*, 8 (1947): 173–187 at 173. See also Lawrence Horn's discussion of infinite judgment in *A Natural History of Negation* (Chicago: University of Chicago Press, 2001), 15 and 42.

⁴⁷ These forms, of course, depend upon the specific language in question. Kant himself used “nicht-” as a prefix in the compounds “nichtsterblich” and “Nichtsterbende.” In his commentary on infinite judgment, Hermann Cohen suggests using *unsterblich* as the paradigmatic case of infinite judgment to distinguish it from negative judgments. Cohen, *Logik der reinen Erkenntnis* (Berlin: Bruno Cassirer Verlag, 1922), 90. Aristotle's own discussion relies upon the placement of negative particles in a sentence. See Horn, *A Natural History of Negation*, 15.

from the negative judgment that ‘The soul is-not mortal,’ because the latter statement simply denies that the soul has a predicate, while the infinite judgment asserts that “die Seele *eines* von der unendlichen Menge Dinge sei, die übrig bleiben, wenn ich das Sterbliche insgesamt wegnehme.” (A72/B97). This distinction rests upon Kant’s theory of predication as either assigning the subject to the sphere of a concept or excluding it from this sphere. Negative judgments thus deny that the subject falls within the space of a particular concept, while infinite judgments affirm that the subject falls within the *infinite* space outside of this concept. These judgments limit the infinite sphere by removing the finite region of the predicate.

Kant thus implies that more is required for an infinite judgment than for the corresponding negative judgment. In Kant’s view, an additional principle, the “principle of complete determination,” is required to pass from a negative to an infinite judgment: this principle specifies that each thing either falls within the sphere of a concept or in the infinite sphere outside of it.⁴⁸ In the case of the judgment that the soul is immortal, the finite sphere demarcating the boundary of the mortal is removed from the infinite sphere of the possible:

Dadurch aber wird nur die unendliche Sphäre alles Möglichen in so weit beschränkt, daß das Sterbliche davon abgetrennt, und in dem übrigen *Raum ihres Umfangs* die Seele gesetzt wird. Dieser Raum bleibt aber bei dieser Ausnahme noch immer unendlich, und können noch mehrere Teile weggenommen werden, ohne daß darum der Begriff von der Seele im mindesten wächst, und bejahend bestimmt wird. Diese unendliche Urteile also in Ansehung des logischen Umfanges sind wirklich bloß beschränkend in Ansehung des Inhalts der Erkenntnis überhaupt (A72–73/B98)

⁴⁸ See the Transcendental Ideal for a discussion of this principle of complete determination (A571/B599–A572/B600). See also Longuenesse, *Kant and the Capacity to Judge*, 294–298, for a clear discussion of this principle and the relationship of the principle of infinite judgment to the rationalists’ argument for an *ens realissimum*.

Infinite judgments are thus limitative judgments (*beschränkend*), and Kant aligns this form of judgment with the category of limitation (A80/B106) and both of these with the principle of intensive magnitudes.⁴⁹ He elaborates upon the connection between infinite judgment and limitation in his first remark on infinite judgment in the *Jäsche Logik*:

Das unendliche Urtheil zeigt nicht bloß an, daß ein Subject unter der Sphäre eines Prädicats nicht enthalten sei, sondern daß es außer der Sphäre desselben in der unendlichen Sphäre irgendwo liege; folglich stellt dieses Urtheil die Sphäre des Prädicats *als beschränkt* vor.

Alles Mögliche ist entweder A oder non A. Sage ich also: etwas ist non A, z. B. die menschliche Seele ist nicht-sterblich, einige Menschen sind Nicht-gelehrte u. dgl. m., so ist dies ein unendliches Urtheil. Denn es wird durch dasselbe über die endliche Sphäre A hinaus nicht bestimmt, unter welchen Begriff das Object gehöre, sondern lediglich, daß es in die Sphäre außer A gehöre, welches eigentlich gar keine Sphäre ist, sondern nur die *Angrenzung einer Sphäre an das Unendliche oder die Begrenzung selbst*. Obgleich nun die Ausschließung eine Negation ist: so ist doch die Beschränkung eines Begriffs eine positive Handlung. Daher sind Grenzen positive Begriffe eingeschränkter Gegenstände. (*Jäsche Logik* §22, Ak. 9:104)

Kant thus employs his analysis of infinite judgment to show again that limits are positive concepts. The limit demarcated by infinite judgment is positive, however, because it results from the act of *positing* something—specifically, positing something in contradistinction to the sphere of A. In the *Prolegomena*, Kant had similarly insisted that

⁴⁹ The category of limitation correlates to the principle of intensive magnitudes, according to the correspondence between the table of categories and the principles. Longuenesse undertakes a substantial defense of this correspondence in her chapter on the Anticipations (*Kant and the Capacity to Judge*, 294–298 and 305–310). She writes: “limitation (*Einschränkung*) in space and time—that is, enclosing of a reality within limits (*Grenzen*)—is the sensible manifestation of the category of limitation It is also ... what makes possible the quantitative determination of the *degree of reality* of appearances (their intensive magnitude)” (306) and later “for a thing to be thought under concepts that are a (discursive) limitation of the ‘infinite sphere of any possible determination,’ it must first be posited (in respect of its reality) as an (intuitive) limitation of the ‘infinite given magnitudes,’ the formal intuitions of space and time. ... [I]t is precisely the *positing of the real between limits* (*Grenzen*), both temporal and spatial, and the possibility of thinking a continuous variation of these limits, that allows us to cognize the quantitative determination of the real as intensive magnitude. *Discursive* limitation thus presupposes a limitation *in intuition*, exhibited by *synthesis speciosa*” (321).

Grenzen belong to that which they enclose—in other words, that the infinite sphere is posited in relation to an excluded finite sphere, the things that fall under A—and thus that *Grenzen* are accessible to finite cognition. He applies this account to the limits of cognition itself in §57, arguing that the limits of reason's powers of cognition are visible from within the sphere of cognition. If A stands for that which can be experienced, then transcendental inquiry is capable of ascertaining the limits of this A without possessing any determinate concept of what lies beyond these limits.

In the chapter on noumena and phenomena which concludes the Transcendental Analytic, Kant also claims that we can have knowledge of the limits of experience, but he seems to align this limitative knowledge with negative, rather than infinite judgments. He expresses this in the claim that we can have negative, though not positive, knowledge of noumena: we can cognize the limit of experience and thus can negatively determine noumena as falling outside of this limit. In the second edition of the chapter on phenomena and noumena, Kant distinguishes between negative and positive knowledge of noumena and claims that only the former results from the transcendental inquiry that determines the limits of experience:

Wenn wir unter Noumenon ein Ding verstehen, *so fern es nicht Objekt unserer sinnlichen Anschauung ist*, indem wir von unserer Anschauungsart desselben abstrahieren; so ist dieses ein Noumenon im *negativen* Verstande. Verstehen wir aber darunter ein *Objekt einer nichtsinnlichen Anschauung*, so nehmen wir eine besondere Anschauungsart an, nämlich die intellektuelle, die aber nicht die unsrige ist, von welcher wir auch die Möglichkeit nicht einsehen können, und das wäre das Noumenon in *positiver* Bedeutung.

Die Lehre von der Sinnlichkeit ist nun zugleich die Lehre von den Noumeen im negativen Verstande (B307)

Particularly important in this passage is Kant's contrast between the form of judgment involved in understanding a noumenon negatively and that concerned with understanding it positively: in the first case, we understand it as *not* falling under sensible intuition, while in the latter, we understand it as falling under a *non*-sensible form of intuition. Kant thus contrasts two forms of negation, negation of the copula versus term-negation. The form of the latter judgment is positive, as, Kant writes, is the resulting type of understanding. Here, then, it seems that Kant allows for negative judgments of noumena but bans infinite judgments. Cognition of the limits of experience does not allow for the formation of infinite judgments about the conditions for experiencing noumena. Infinite judgments of this type are not possible, because Kant does not hold that we can posit an infinite realm of non-spatiotemporal intuition. Even though this sort of infinite judgment formally resembles the infinite judgments that describe the limitations of cognition, it surreptitiously goes beyond these judgments by allowing for a concept of *non-sensible intuition*. Although Kant only permits negative judgments about the specific properties of noumena, even these judgments presuppose that the limits of experience can be cognized through transcendental reflection. Moreover, despite our inability to form infinite judgments about noumenal properties, we are in fact capable of forming them about experience as a whole. The apparent discrepancy between Kant's statements on infinite judgment rests on the different predicates that apply in each case. If we were able to make infinite judgments about, for instance, noumena as the objects of non-sensible intuitions, we would actually be asserting a positive characteristic of what lies outside of experience. On the other hand, when we say that the transcendental ideas are non-cognizable, we are

placing them within the infinite sphere outside of experience and not affirming any additional properties of these objects.

In his concluding remarks to the Amphiboly, Kant makes this point: “Der Begriff des Noumenon ist also nicht der Begriff von einem Objekt, sondern die unvermeidlich mit der Einschränkung unserer Sinnlichkeit zusammenhängende Aufgabe, ob es nicht von jener ihrer Anschauung ganz entbundene Gegenstände geben möge” (A288/B344). The concept of the noumenon thus figures into a limitative—an infinite—judgment about sensibility itself. Judgments about noumena that are negative in form are in fact equivalent to infinite judgments regarding the limits of experience. As Kant summarizes several sentences later: “Der Verstand begrenzt demnach die Sinnlichkeit, ohne darum sein eigenes Feld zu erweitern. ... Da wir aber keine von unseren Verstandesbegriffen darauf [d.h. auf Noumena] anwenden können, so bleibt diese Vorstellung doch für uns leer, und dient zu nichts, als die Grenzen unserer sinnlichen Erkenntnis zu bezeichnen, und einen Raum übrig zu lassen, den wir weder durch mögliche Erfahrung, noch durch den reinen Verstand ausfüllen können” (A288–289/B345). While Kant does not explicitly name infinite judgment here, it is this sort of judgment that is capable of demarcating limits, as Kant explains in the *Jäsche Logik*.

This connection between the limits of possible experience and infinite judgment implies that infinite judgment is central to the project of transcendental inquiry, since this project is defined as a search for the limits of cognition.⁵⁰ As discussed in the previous chapter, the distinction between limit (*Grenze*) and border (*Schranke*) allows Kant to

⁵⁰ See Jakob Gordin’s discussion of infinite judgment in Kant and Cohen in *Untersuchungen zur Theorie des unendlichen Urteils* (Berlin: Akademie-Verlag, 1929), especially 129–131.

articulate the role of transcendental ideas in defining the territory of cognition.⁵¹ As he writes in the *Prolegomena*, transcendental ideas lead to the “Berührung des vollen Raumes (der Erfahrung) mit dem leeren (wovon wir nichts wissen können, den *Noumenis*)” (*Prol.* §57, Ak. 4:354). These limits of experience are themselves cognizable, even though it is something beyond the border of experience that demarcates this limit. But, as noted in the previous chapter, Kant stipulates that this positive experience of the limit depends upon an *Ungleichartigkeit* within reason itself, because only a discipline that contains this inner division can describe the extent of its own limitation. He does not specify further the nature of this *Ungleichartigkeit* in the *Prolegomena*, though it appears to derive from reason’s capacity to engender dialectical contradictions when it exceeds its domain. In the *Analytic of the Sublime*, Kant returns to this question of internal incongruity, further developing his account of this *Ungleichartigkeit* through his discussion of the *Unangemessenheit* of the imagination to reason’s demands. Insofar as the imagination is made aware of itself as *bestimmt* to something of which it is not capable, it feels itself to be divided. This *Bestimmung*, however, is simultaneously a transgression of a boundary. Kant writes that this determination goes beyond the proper domain of the imagination. It consists in the feeling “einer Bestimmung desselben [des Gemüts], welche das Gebiet der ersteren [der Einbildungskraft] gänzlich überschreitet (dem moralischen Gefühl), in Ansehung dessen die Vorstellung des Gegenstandes als subjektiv-zweckmäßig beurteilt

⁵¹ Kant continues to emphasize the problem of the territory and domain properly assignable to each faculty in the third *Critique*. In the Introduction, he defines these concepts, writing: “Begriffe, sofern sie auf Gegenstände bezogen werde ... haben ihr Feld Der Teil dieses Feldes, worin für uns Erkenntnis möglich ist, ist ein Boden (*territorium*) für diese Begriffe und das dazu erforderliche Erkenntnisvermögen. Der Teil des Bodens, worauf dies gesetzgebend sind, ist das Gebiet (*ditio*) dieser Begriffe und der ihnen zustehenden Erkenntnisvermögen” (*KdU*, Introduction, Ak. 5:174).

wird” (*KdU*, Ak. 5:116). The mind possesses a *Bestimmung* that extends beyond its domain; it has a tendency to cross over a boundary and in this transgression to become aware of its superior power. This description of the crossing over of the domain of the faculties thus provides a new explanation for the way in which the limits of cognition are felt and for the sense in which there must be an *Ungleichartigkeit*: it specifies that this requires a determination of the mind that crosses beyond its proper sphere.

In his 1790 discussion, however, Kant seems to contradict a central element of his earlier account of the limits of reason. While the analyses in the *Prolegomena* and first *Critique* implied that knowledge of the limits of experience is compatible with the conditions of experience, in the section on the sublime, it appears as if the *Grenzen* of cognition can be felt through an activity contrary to the linear progression of inner sense. What accounts for this apparent change in Kant’s views on the *Grenzen* of cognition? First, in the *Analytic of the Sublime*, Kant is setting out not the conditions for us to have negative cognition of the supersensible through the internal limits of reason but the occasion upon which a particular feeling of this supersensible capacity is provoked. According to this suggestion, while the cognition of the limits of experience might be compatible with its conditions, the *feeling* of these limits would require violence against inner sense. Kant’s account of the nature of this feeling supports this supposition, for the structure of the feeling itself mirrors that of the limit. This feeling is one of a *Lust* through an *Unlust*, of a pleasure that depends upon its contrary. This form of pleasure implies that these terms cannot be positive and negative magnitudes, p and $-p$, since

otherwise they would simply cancel each other out.⁵² But they can no more be logical contradictories, since in that case they could not coexist on pain of inconsistency. Instead, they must relate the subject's feeling to different determinations: with respect to the task of the presentation in inner sense, the subject feels *Unlust* but this *Unlust* shows that the imagination has a higher determination—since otherwise it would not undertake the task at which it fails—and this awareness of the determination is itself pleasure.⁵³ The parallel between the structure of limit/unlimited and displeasure/pleasure suggests why an act contrary to the form of inner sense would provoke such a feeling. In his discussion of the third moment of the judgment of taste, Kant defines pleasure and displeasure: “Das Bewußtsein der Kausalität einer Vorstellung in Absicht auf den Zustand des Subjekts, es in demselben *zu erhalten*, kann hier im allgemeinen das bezeichnen, was man Lust nennt; wogegen Unlust diejenige Vorstellung ist, die, den Zustand der Vorstellungen zu ihrem eigenen Gegenteile zu bestimmen (sie abzuhalten oder wegzuschaffen), den Grund enthält” (*KdU*, §10, Ak. 5:220). Although a proper discussion of the concepts of pleasure and displeasure would require us to investigate Kant's concept of the consciousness of the causality of a representation, his definition here at least reveals that pleasure aims at a continuation of the subject's condition, while displeasure attempts to abolish this condition. In the case of the pleasure in the sublime, the subject would then attempt to

⁵² This implies that the relationship between *Lust* and *Unlust* here is not simply a case of the “real repugnance” Kant considered in his essay on Negative Magnitudes discussed in the previous chapter: first, the *Unlust* stands in a purposive relation to the *Lust* (it is *in virtue of* our *Unlust* that we recognize the higher capacity within ourselves that engenders this *Lust*), and, second, the *Unlust* is preserved within the complex resulting state.

⁵³ Kant names the pleasure that results a “negative Lust” (*KdU*, §23, Ak. 5:245). Makkreel argues that the feelings do not cancel each other out because they are purposively related and thus are “felt to coexist. One is comprehended by virtue of the other.” *Imagination and Interpretation in Kant*, 79.

continue a particular state through the very attempt to cancel this state. The *Unlust* results from a form of presentation that is not in conformity with inner sense, while the *Lust* arising from this would correspond to the awareness that the ideas of reason continue to exist even when the conditions of perception in time are not met.

But there is a second, equally important, reason why the feeling of the *Grenzen* of experience requires a violence done to the inner sense: Kant has introduced an additional meaning of the concept of the limit in the section on the sublime. Here, Kant uses the concept of limit in the sense of an asymptote, a point towards which a function tends but which it does not achieve for any finitely accessible term. It is this sense of limit that is relevant to his attempt to provide a theory of the *Augenblick*. As he had already made clear in the Anticipations, the instant is the limit of time: it is the point at infinity toward which ever-decreasing temporal durations tend. This dimension of the concept of limit does not feature prominently in the discussions of *Grenzen* and *Schranken* in his theoretical philosophy, but it becomes dominant when Kant attempts to provide a single description of the feeling of limitation in his discussion of the instant in the Analytic of the Sublime. Indeed, what is distinctive about Kant's account here is his combination of the two senses of the limit: the limit as an enclosing boundary of which we can have positive knowledge and the limit as the point towards which a sequence tends which can never be achieved. These two senses come together in Kant's discussion of the *Einheit* that does violence to inner sense and allows it to feel the limits of aesthetic comprehension. In the final paragraph of §27, Kant writes:

Wenn nun eine Größe beinahe das Äußerste unseres Vermögens der Zusammenfassung in eine größere Einheit aufgefordert wird, so fühlen wir uns im

Gemüt als ästhetisch in Grenzen eingeschlossen; aber die Unlust wird doch in Hinsicht auf die notwendige Erweiterung der Einbildungskraft zur Angemessenheit mit dem, was in unserem Vermögen der Vernunft unbegrenzt ist, nämlich der Idee des absoluten Ganzen, mithin die Unzweckmäßigkeit des Vermögens der Einbildungskraft für Vernunftideen unter deren Erweckung doch als zweckmäßig vorgestellt” (Ak. 5:259–260)

Kant does not claim here that the imagination fails to comprehend the magnitude in question, but that we feel ourselves to be enclosed aesthetically in limits. This leads to an *extension* of the imagination itself in accordance with the *limitlessness* of the idea of absolute totality. Absolute totality occupies a parallel place to the unachievable but nevertheless felt *Augenblick*: the limit of temporal duration is the occasion for the feeling of the demand for an infinite given totality. Not only the relation or measure between self and nature is at stake here, but also the question of what constitutes an “all” or totality. For Leibniz, infinite totalities are given to all minds—and thus to everything real—but only God has full cognition of these infinities; for Kant, infinite totality is susceptible to “negative Darstellung,” a presentation by way of the limit of the condition of time.

In a central passage from the “Allgemeine Anmerkung zur Exposition der ästhetischen Urteile,” Kant refers to the imagination as feeling “unbegrenzt” in its presentation of the sublime; this amounts, Kant writes, to a “Darstellung des Unendlichen,” which must be a “negative Darstellung” (*KdU*, General Remark, Ak. 5:274) This negative presentation of the infinite arises from the stretching of imagination to its limits: “Diese Idee des Übersinnlichen aber...wird in uns durch einen Gegenstand erweckt, dessen ästhetische Beurteilung die Einbildungskraft bis zu ihrer Grenze, es sei der Erweiterung (mathematisch) oder ihrer Macht über das Gemüt (dynamisch),

anspannt” (Ak. 5:268). The imagination reaches a limit in two different senses. First, it is stretched—*anspannt*—to its maximum, but, second, it is extended to a *limitative* judgment. The imagination’s feeling of *Unbegrenztheit* is a feeling that accompanies an infinite judgment—the judgment of falling outside of the limits of limitation, of occurring on the edge of the empty space that touches the finite excluded realm. Thus, both *negative Lust* and *negative Darstellung* are forms of negation that have the same formal characteristics as infinite judgments: judgment on the limits of presentation and pleasure as such. The *Erweiterung* and *Macht* the imagination receives depend upon its self-sacrifice. Expansion occurs at a cost, but when the sublime is successful, the resulting “extension” is “greater” (*größer*) than what has been given up. The successful exchange in the sublime, however, “borders” (*grenzt*) upon a merely destructive state.⁵⁴ Indeed, it gains an infinite extent but only through the feeling of an empty, infinite sphere that is nevertheless felt from within the enclosure of the finite mind.

Infinite judgment—and the category of limitation—express in a propositional form what is presented in experience as possessing intensive magnitude. This relationship derives from the priority of the whole to its parts both in the case of infinite judgment and in intensive magnitudes. Insofar as infinite judgment starts from the idea of a sphere of all possible realities in which limitations are drawn, it relies upon a form of magnitude that grants priority to the unity of the whole of reality. This whole cannot, of course, be extensive—it is not a sum of all realities but its *Inbegriff*. While Kant maintains that any ontological argument regarding the existence of this *Inbegriff* would exceed reason’s limits, and thus seems to reject the Leibnizian account of intensity, he in fact situates intensity

⁵⁴ Kant considers, for instance, “die *Verwunderung*, die an Schreck grenzt” (Ak. 5:269).

on the level of the subject's feeling of her own *Unbegrenztheit*. Intensity thus does not only pertain to the real corresponding to sensation but to the subject's feeling with regard to limitation itself. The Analytic of the Sublime constitutes a dialectic of intensity, because it revolves around the feeling, rather than the mere thinking, of a *totum realitatis*, an intensive unity of totality. Since aesthetic magnitude—itsself intensive—is required for all measurement, and aesthetic comprehension always threatens a “regressive violence,” the feeling of limitation, and thus of the infinite judgment of intensity, is also a necessary possibility of all judgments of magnitude and all acts of comprehension.

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(For abbreviations, see the introductory matter.)

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