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On the Necessity and Nature of Simples:
Leibniz, Wolff, Baumgarten, and the
Pre-Critical Kant

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Standard histories of modern philosophy suggest, at least by their practice, that the philosophical landscape in Germany between Leibniz's death in 1716 and the publication of Kant's *Critique of Pure Reason* in 1781 is of little significance, either intrinsically or for our understanding of those modern philosophers that are of interest. For example, Christian Wolff, whose comprehensive series of systematic textbooks was extremely influential at the time, is typically mentioned not for his own philosophical views, but rather for popularizing Leibniz's philosophy. Alexander Baumgarten is widely recognized for his early advocacy of aesthetics as an autonomous discipline, but not for his views in metaphysics and epistemology, since his primary contribution in theoretical philosophy was a Latin textbook whose most immediately noticeable departure from Wolff is its unusually terse mode of presentation. The pre-Critical Kant is often dismissed as well, in part owing to disparaging remarks that he later made about his early works, and in part owing to the judgement that his pre-Critical writings are an instance of precisely the kind of dogmatic metaphysics that his Critical philosophy is supposed to overcome. The same refrain is repeated with minor variations for many other figures at the time, such as Martin Knutzen, Moses Mendelssohn, and Johann Nicolas Tetens. The standard picture is thus that Leibniz is the master, while Wolff and Baumgarten endeavour simply to reproduce his philosophy in a more systematic form, and the pre-Critical Kant bides his time with fruitless metaphysical inquiries until his revolutionary meta-philosophical reflections bring about the Critical turn and an entirely new way of thinking. As a result, the standard view

is committed to ascribing a more or less monolithic philosophical position to Leibniz and his immediate successors in Germany in so far as Wolff and Baumgarten are judged by the extent to which they capture (or distort) Leibniz's actual position, while the pre-Critical Kant is viewed as reacting to them in ways that are of no lasting interest because of the vast gulf that allegedly separates the pre-Critical from the Critical Kant. While differences between the views of these figures may be acknowledged regarding certain inessential details, the fundamental assumptions, arguments, and positions are, or at least ought to be, roughly the same.

Since the standard view gives rise to an expectation of considerable uniformity, it is quite striking to note how significant the difference is between Leibniz's fully *idealistic* monadology and the pre-Critical Kant's *physical* monadology. Leibniz, in his later years, explicitly holds that everything—including bodies—is ultimately composed entirely of mindlike entities, i.e. substances endowed with a representative power, whereas the pre-Critical Kant asserts that all bodies are composed of physical points that are endowed with mass (inertial force) and exercise attractive and repulsive forces. Obviously enough, these radical differences immediately entail that the standard view cannot be maintained. However, they also raise a question that is both more interesting and more important: How is this shift from Leibniz's idealistic monadology to the pre-Critical Kant's physical monadology to be explained?

The short answer is that, for philosophical and historical reasons to be described in detail below, Wolff, Baumgarten, and the pre-Critical Kant all reacted to their predecessor's views on a series of more limited points that, taken together, amounted to a much more radical shift. This answer is instructive on several counts. For one, not only does it set the historical record straight, but, more importantly, it can also do so in such a way that each figure can be represented as reacting in a fully intelligible way to the situation he encountered. For another, by allowing us to see Leibniz's philosophy—its assumptions, arguments, and aims—not from the perspective of a radically opposed position or even that of a sympathetic contemporary reader simply intent on understanding what Leibniz actually thought, but rather from perspectives that can seem to differ from it only slightly, one can come to appreciate a wealth of surprisingly rich possibilities that are

implicitly contained in Leibnizian philosophy that Leibniz himself did not explicitly pursue. Finally, by adopting such a point of view, one can also have clearer insight into the significance of certain structural features of Leibniz's and the Critical Kant's philosophies that may not otherwise be immediately apparent.

More specifically, in the following I show that Wolff, Baumgarten, and the pre-Critical Kant attempt to develop novel arguments for the necessity of simple substances, or monads, and to articulate a range of positions regarding the nature of such substances, and that, when taken in context, the differences in their arguments and positions make good historical and philosophical sense. (1) I first present, as the requisite background, Leibniz's position on these topics and certain questions that naturally arise with regard to them. (2) I then explain two main components of Wolff's reaction. Though Wolff accepts Leibniz's main argument for the necessity of simples, he develops a second argument that is different from anything Leibniz formulates in print, though it is based on principles that Leibniz accepted (and mentions briefly in private correspondence). In fact, since this new argument is not tied to a criticism of Descartes's position, as Leibniz's primary argument is, it even represents an advance over Leibniz's in terms of its scope. Wolff is also agnostic about the nature of simples that compose bodies, given that Leibniz has, he thinks, never in fact proved that all simples must be endowed with the power to represent the world, and his agnosticism on this point has several important consequences for aspects of his broader view.

The next step (3) is to show how Baumgarten takes advantage of the space that Wolff's agnosticism about the nature of simples has created by suggesting that monads could be nothing more than physical points endowed with impenetrability, a view that Leibniz does not explicitly argue against and that he may not even have entertained in the form in which Baumgarten proposed it. I then explain (4) how the pre-Critical Kant embraces Baumgarten's suggestion that monads are physical and, owing to his interest in scientific issues and his early acceptance of Newtonian physics, develops a more robust physical monadology by ascribing inertia and attractive and repulsive forces to physical monads and having them play a foundational metaphysical role in his physics. Kant's understanding of how a physical monadology should be understood brings with it a significant revision of Leibniz's

distinction between primitive and derivative forces, which allows him to respond in original ways to the questions that naturally arose for Leibniz and that remained problematic for Wolff and Baumgarten to varying degrees. In short, we get from Leibniz's idealistic monadology to the pre-Critical Kant's physical monadology by reflecting on what the strongest argumentative basis for the necessity of monads might be and by seeing (with Wolff's help) that monads do not have to be minds (or very much like minds), as Leibniz held, but could be physical in either a minimal sense (as Baumgarten suggested) or a much more robust sense (as Kant argued) by being an integral part of one's scientific view.

This depiction of the historical development from Leibniz's idealistic to the pre-Critical Kant's physical monadology illustrates in a very concrete way how distinctively Leibnizian positions could be developed in detail and with significant philosophical support in their favour. However, it also opens up a perspective (5) from which one can attain three further insights. First, it reveals the importance of activity not only for the unity that substances have intrinsically, but also for the unity that obtains between substances belonging to larger unities, such as that of the world as a whole. Second, it establishes the centrality of Leibniz's distinction between primitive and derivative forces, and also raises important questions about why he understands that doctrine exactly as he does. Finally, it gives us a better understanding of the context of the development of the Critical Kant's acceptance of idealism. To follow the path that leads from Leibniz to Kant and these further insights, however, it is necessary to begin by considering Leibniz's reaction to Descartes in the 1680s and 1690s.

I. LEIBNIZ

In 1686, in a short note published in the *Acta eruditorum*, Leibniz argued that Descartes's physics was based on a law of motion that is false.¹ Specifically, Leibniz attacked Descartes's law according to

¹ 'Brevis Demonstratio Erroris memorabilis Cartesii et aliorum circa legem naturae, secundum quam volunt a Deo eandem semper quantitatem motus conservari; qua et in re mechanica abutuntur. Communicata in litteris d. 6. Jan. 1686 datis' (*Acta Eruditorum* (1686); repr. in GM vi. 117–19).

which the quantity of motion, represented by the product of volume and motion, had to be conserved in the world. Leibniz suggested that when conjoined with certain other assumptions, Galileo's law of freely falling bodies is inconsistent with Descartes's law, and that what he called living force, as measured by mv^2 , must be conserved throughout all changes in bodies instead. Though Leibniz's remarks spurred considerable debate in learned circles in Europe throughout the next half-century by initiating the so-called *vis viva* controversy, his initial critique of Descartes was limited to a *single* foundational issue in *physics*.

In 1695 Leibniz broadened considerably the scope of his public critique of Descartes with the publication of 'A New System of the Nature and Communication of Substances, and of the Union of the Soul and Body' in the *Journal des Savants*.² In this article, Leibniz attacked *several* of Descartes's fundamental *metaphysical* claims. Perhaps best known is his discussion of the mind-body relationship.³ Specifically, in the latter half of the 'New System', Leibniz rejects both Descartes's interactionist position and Malebranche's occasionalist alternative. The mind and the body cannot act on each other, as Descartes seemed to hold, since it is a fundamental truth of metaphysics, Leibniz argues, that no two finite substances can act on each other causally.⁴ (Elsewhere, Leibniz also contends that since the natures of mind and body are, according to Descartes, radically distinct, there can be no proportion and hence no intelligible connection between any state of the mind and any particular motion of the body, which thus rules out causal interaction between mind and body.⁵) And while Leibniz certainly grants that God creates everything that exists at every moment in time, he rejects the occasionalist gambit of interpreting God to be the *sole* cause of the (mental and bodily) states of finite substances. If one were to appeal solely to divine intervention

² While Leibniz published this article anonymously, it was well known that he was its author. In fact, it stimulated considerable discussion, with Foucher, de Beauval, Bayle, and others publishing criticisms of it, criticisms to which Leibniz responded in print.

³ For simplicity's sake, I shall use the term 'mind' very broadly to refer to both rational and non-rational souls and to cover what Descartes, Leibniz, Wolff, Baumgarten, and Kant mean, despite their various significant doctrinal differences.

⁴ As Leibniz remarks in the 'New System', 'the action of one substance on another is neither the emission nor the transplanting of an entity' (Gottfried Leibniz, *Philosophical Essays [Essays]*, ed. and tr. R. Ariew and D. Garber (Indianapolis: Hackett, 1989), 141).

⁵ See Leibniz's letter to Arnauld, 30 Apr. 1687, in Leibniz, *Essays*, 83.

to explain specific states of the world, and not to secondary causes as well (i.e. to the causal activity of finite substances), one would, he objects, be committed to perpetual miracles.⁶

Since Descartes's and Malebranche's ways of explaining the relation between the mind and the body are inadequate, Leibniz proposes a third: 'we must say that God originally created the soul (and any other real unity) in such a way that everything must arise for it from its own depths, through a perfect *spontaneity* relative to itself, and yet with a perfect *conformity* relative to external things'.⁷ That is, according to Leibniz's 'new system', a finite substance can act only on itself so as to cause the progression of its own states, though God has set up all finite substances prior to creation so that their states appear harmonious despite the absence of any real causal interaction between them. Leibniz then goes on to point out that his 'new system' not only presents the sole possible account of the mind-body relation, but also fits well with several other orthodox metaphysical theses, such as the existence of God and the freedom of the soul. Thus, in the 'New System' Leibniz argues that by attending to difficulties inherent in Cartesian positions on the mind-body relationship, an interesting and, he thinks, more satisfying alternative can be developed.

Earlier in the 'New System', however, Leibniz had also presented an argument against another of Descartes's distinctive metaphysical theses, namely that bodies are nothing more than extended substances. According to Descartes, bodies do not consist of substantial forms and primary matter, as scholastic Aristotelians had thought; nor, as Leibniz understands him, are they the seats of active causal powers by means of which they could cause changes of motion in each other; rather, as purely geometrical figures, they are simply extended in space.⁸ Leibniz

⁶ Leibniz, *Essays*, 143.

⁷ Ibid.

⁸ Descartes's actual views on this point are a matter of dispute. On the one hand, Descartes consistently emphasizes that bodies are simply extension, which would seem to be exhausted by their geometric and kinematic properties of size, shape, position, motion, rest, number, and duration. In the *Principles of Philosophy* (Part II, principle 11), Descartes explicitly argues that there is no real distinction between space and body (or corporeal substance). This view has been defended by Daniel Garber (*Descartes' Metaphysical Physics* (Chicago: University of Chicago Press, 1989)), Gary Hatfield ('Force (God) in Descartes' Physics', *Studies in History and Philosophy of Science*, 10 (1979), 113–40), and Peter Machamer ('Causality and Explanation in Descartes's Natural Philosophy', in P. Machamer and R. G. Turnbull (eds.), *Motion and Time* (Columbus: Ohio State University Press, 1976)). On the other hand, Descartes's argument for the existence of the external world in Meditation

explains how he came to think about bodies, or matter, in a very different way as follows:

In the beginning, when I had freed myself from the yoke of Aristotle, I accepted the void and atoms, for they best satisfy the imagination. But on recovering from that, after much reflection, I perceived that it is impossible to find the *principles of a true unity* in matter alone, or in what is only passive, since everything in it is only a collection or aggregation of parts to infinity. Now, a multitude can derive its reality only from *true unities*, which have some other origin and are considerably different from [[mathematical]] points [[which are only the extremities and modifications of extension,]] which all agree cannot make up the *continuum*. Therefore, in order to find these *real entities* I was forced to have recourse to a formal atom, since a material thing cannot be both material and, at the same time, perfectly indivisible, that is, endowed with a true unity.⁹

Leibniz thus clearly rejects Descartes's account of matter. His reasoning in this passage, however, is perhaps not made fully explicit, as the argument can be developed in (at least) two different versions. The first version, for which the *infinite divisibility* of matter is crucial, proceeds as follows. If matter is simply extension, as Descartes held, and if extension is infinitely divisible, then matter is infinitely divisible. However, if matter is infinitely divisible, then everything in it is only a collection or aggregation of parts to infinity. Therefore, matter, on Descartes's conception, is only a collection or aggregation of parts to infinity. However, if matter is only a collection of parts to infinity, then it has no ultimate parts, but since the reality of a whole depends on the reality of its parts, matter, lacking ultimate parts, must also lack reality, given that 'what is not truly *one* being is not truly *one being*'.¹⁰ However, a second version, which depends essentially on

6 seems to require the causal efficacy of bodies. Attributing causal efficacy to bodies has been developed in different ways by Alan Gabbey ('Force and Inertia in the Seventeenth Century: Descartes and Newton', in S. Gaukroger (ed.), *Descartes: Philosophy, Mathematics, and Physics* (Brighton: Harvester, 1980), 230–320) and Michael Della Rocca ('"If a Body Meets a Body": Descartes on Body–Body Causation', in R. J. Gennaro and C. Huenemann (eds.), *New Essays on the Rationalists* (New York: Oxford University Press), 48–81).

⁹ Leibniz, *Essays*, 139. Text enclosed in brackets are thought to be later additions Leibniz made to his own manuscript, which were not included in the published version.

¹⁰ This quotation is from Leibniz's correspondence with Arnauld, 30 Apr. 1687, in Leibniz, *Essays*, 86. Leibniz repeats essentially the same argument in 'On Nature Itself' (ibid. 162).

the contrast between the *continuity* of matter and the *discreteness* of reality, can be articulated as follows.¹¹ For Leibniz's problem with Descartes's conception of matter could be not that matter cannot consist of ultimate parts (given that the infinite divisibility of matter precludes such parts), but rather that whatever parts one arrives at through division must be continuous, which is inconsistent with Leibniz's view that reality (or any whole that is to be real) must consist of discrete parts.¹² In short, since real entities must be discrete, but matter, considered as consisting in extension alone, is not, matter cannot be real.¹³ On either version of Leibniz's argument, however, it follows that matter, as Descartes understood it, lacks true unities and thus reality.

If matter can thus be real only if 'true unities' exist, what, according to Leibniz, must such simple entities be like? In the passage quoted above, Leibniz argues that the true unities that are required for the reality of matter can be neither material atoms nor (mathematical) points. If the true unities were material atoms, then they would be spatially extended and thus divisible, i.e. not truly unities or simple. If they were (mathematical) points, then they would be unities, but they could not, in that case, constitute the continuous nature of extended matter (as Descartes conceived of it), since (i) even an infinite number of unextended points cannot constitute a continuous magnitude (such as a line) and (ii) (mathematical) points are merely limitations or modifications *of* extension and thus cannot constitute extension itself. Leibniz's arguments thus show that matter can consist neither in extension alone, as Descartes held, nor in material atoms, as Democritus and Newton thought, nor in (mathematical) points.

¹¹ That Leibniz characterizes Descartes's position as positing the nature of matter in what is merely passive could suggest yet a third version of the argument. For Leibniz could be objecting that matter, considered merely as extension, cannot be real since it is not active and only what is active can be real. We shall return to the importance of activity to Leibniz's metaphysics below. It is immediately clear, however, that the textual basis for this last version of the argument is the slimmest of the three.

¹² For discussion of Leibniz's views on the relationship between mathematics and metaphysics in Leibniz's middle and later years, see Samuel Levey, 'Leibniz on Mathematics and the Actually Infinite Division of Matter', *Philosophical Review*, 107 (1998), 49–96.

¹³ The second version of this argument may not ultimately be distinct from the first, since it is possible that the reason that only discrete entities can be real is that only they possess the requisite kind of unity. Leibniz's mention of continuity may thus simply be a remark hinting at an intermediary step in the argument.

Instead, one must accept indivisible unities of some other kind to make sense of the reality of extended bodies.

Later in the 'New System', Leibniz repeats several elements of his argument against Descartes and then describes his positive conception of the simples that are required by his argument as follows:

In addition, by means of the soul or form there is a true unity corresponding to what is called the *self* (*moy*) in us. Such a unity could not occur in the machines made by a craftsman or in a simple mass of matter, however organized it may be; such a mass can only be considered as an army or a herd, or a pond full of fish, or like a watch composed of springs and wheels. Yet if there were no true *substantial unities*, there would be nothing substantial or real in the collection. That was what forced Cordemoy to abandon Descartes and to embrace the Democritean doctrine of atoms in order to find a true unity. But *atoms of matter* are contrary to reason. Furthermore, they are still composed of parts, since the invincible attachment of one part to another (if we can reasonably conceive or assume this) would not eliminate diversity of those parts. There are only *atoms of substance*, that is, real unities absolutely destitute of parts, which are the source of actions, the first absolute principles of the composition of things, and, as it were, the final elements in the analysis of substantial things. We could call them *metaphysical points*: they have *something vital*, a kind of *perception*, and *mathematical points* are the *points of view* from which they express the universe. But when corporeal substances are contracted, all their organs together constitute only a *physical point* relative to us. Thus physical points are indivisible only in appearance; mathematical points are exact, but they are merely modalities. Only metaphysical points or points of substance (constituted by forms or souls) are exact and real, and without them there would be nothing real, since without true unities there would be no multitude.¹⁴

In this passage, the true unities or formal atoms that Leibniz had argued for previously are referred to as metaphysical points, which are contrasted with mathematical and physical points, and are likened to our mind or soul. He defines a metaphysical point as a substantial unity destitute of parts, but also describes it further—without explicit argument—as what has a representative power or force of perception, as what is alive, as what contains the source of its actions within itself, and as what serves as the fundamental principle of composition. The

¹⁴ Leibniz, *Essays*, 142.

similarities between metaphysical points and Aristotelian substantial forms are not accidental; in an earlier passage, Leibniz indicates that he is happy to rehabilitate certain aspects of Aristotelian substantial forms in describing his true unities or formal atoms.¹⁵

If one follows Leibniz in accepting the idea that the true unities that are required for the reality of extended bodies are metaphysical points endowed with representational force, how exactly does a metaphysical point serve as the fundamental principle of composition and thus allow him to avoid the objection that he raised for Descartes's account? That is, how is the unity that one entity possesses—mind—relevant to bestowing reality on another entity—extended body—that lacks such a unity? To understand Leibniz's reply, one must first attend to a distinction he draws between being *per se* and being *per accidens*. To be an entity that can exist independently of others, a substance must be able to exist entirely through itself and thus must have being *per se*. A collection, composite, or aggregate, by contrast, is not capable of independent existence, since it can exist only if a certain accidental relation holds among its members, for which reason it is said to have being only *per accidens*. Accordingly, it is clear that extended bodies, which, in virtue of their infinite divisibility, are simply a certain kind of aggregate, cannot have being *per se*, but rather only being *per accidens*.¹⁶

With this distinction in hand, we can turn to a passage from Leibniz's *New Essays on Human Understanding* (written in 1704–5,

¹⁵ Unfortunately, Leibniz does not adequately clarify in that passage the precise role that substantial forms are supposed to play in his ontology. Borrowing on distinctions that have been drawn in the literature, especially by Robert Adams (*Leibniz: Determinist, Theist, Idealist* [Idealist] (New York: Oxford University Press, 1994)) and Daniel Garber (most recently in 'Leibniz and Fardella', in P. Lodge (ed.), *Leibniz and his Correspondents* (New York: Cambridge University Press, 2004), 123–40), Leibniz's position can be interpreted in very different ways. For example, this passage leaves open whether a metaphysical point is an independently existing substance in its own right, or whether it is simply one constituent principle of substances that also stand in need of a second, namely matter. It also leaves open the question of whether there are two kinds of substances (simple and composite, i.e. corporeal, substances) or only one, and if the latter, whether the matter to which a substantial form added is an organic body or simply an element of passivity (that would contrast with the activity of the substantial form). While Leibniz does clearly accept this latter view (and also a fully idealist version of it) in *The Monadology*, his view in the so-called middle period (in the mid-1680s) is less clear.

¹⁶ In fact, in the passage quoted above, Leibniz seems to be drawing a contrast between these different kinds of unity when he insists that 'a simple mass of matter, however organized it may be', can 'only be considered as an army or a herd or a pond full of fish', not a 'true unity' like our soul.

though published only much later in 1765), where he describes the sense in which aggregates have unity and thus reality as follows:

This unity of the idea of an aggregate is a very genuine one; but fundamentally we have to admit that this unity that collections have is merely a respect or a relation, whose foundation lies in what is the case with each of the individual substances taken alone. So the only perfect unity that these 'entities by aggregation' have is a mental one, and consequently, their very being is also in a way mental, or phenomenal, like that of the rainbow.¹⁷

That is, Leibniz maintains that aggregates do not have unity intrinsically or being *per se* because their unity is not the unity that substances have as such. However, he insists that they do still have a unity and it is 'very genuine'. Instead of being a substantial unity, this unity is a relation among a plurality of entities that obtains, in part, on the basis of features of each of the individual entities 'taken alone'. For an aggregate has a unity only if its members possess properties in virtue of which they stand in a certain relation to each other. But Leibniz seems to think that the properties of such entities do not stand in this relation when 'taken alone'. If a relation is to obtain between the properties of distinct entities, they must be *taken together*; a mind, Leibniz thinks, must actively represent each entity as standing in relation to others that are to be members of the aggregate. For example, an army possesses no unity on its own and is not an entity in its own right; instead, it exists only if there is a plurality of soldiers whom, say, a general thinks of as standing in certain relations to each other.¹⁸ Similarly, a body, as a collection that is infinitely divisible into smaller spatially extended parts, is not an entity existing in its own right, but rather derives its reality from a relation among the properties of its parts (or constituent entities) that a mind grasps as related (e.g. spatially). Thus, it is legitimate to speak of the reality of a collection or aggregate but only because a mind actively imposes an accidental unity on a plurality of entities on the basis of relations

¹⁷ Leibniz, *New Essays on Human Understanding*, ed. P. Remnant and J. Bennett (New York: Cambridge University Press, 1996), 146. For discussions of this issue, see Donald Rutherford, *Leibniz and the Rational Order of Nature* (New York: Cambridge University Press, 1995), 136, 271–2, and Paul Lodge, 'Leibniz's Notion of an Aggregate', *British Journal for the History of Philosophy*, 9 (2001), 467–86.

¹⁸ Leibniz's own example illustrates this point as well, since the 'springs and wheels' of a clock are united by our perceiving them as being related so as to tell time.

it perceives among their properties.¹⁹ Leibniz can attribute unity and thus reality to bodies in this way, but it is important to note that he can do so only by requiring that minds actively *take* a plurality of entities *together* and represent them as related and hence united in virtue of their intrinsic properties.²⁰ It is for this reason that he explicitly characterizes the unity and reality of aggregates or collections as *mental* or *phenomenal*; a collection is an ideal rather than a real entity.

Leibniz discusses the relationship between metaphysical unities and physical bodies further in the 'Specimen dynamicum', Part I of which appeared in the *Acta eruditorum* in the same year as the 'New System' was published. In the course of articulating a dynamical physics that was designed to complement his distinctive metaphysics, Leibniz distinguishes between primitive and derivative forces and then further between active and passive instances of each. Primitive active forces are described as substantial forms, which thus function as the true unities required by his objection to Descartes's position. Primitive passive forces, by contrast, are identified with prime matter, though he notes that this term is to be conceived of not in exactly the same sense as the scholastics had, but rather as the power to resist change. Since both kinds of primitive force are enduring first principles of things, they are, Leibniz claims, only 'general causes' and cannot be used to explain particular phenomena. In Leibniz's mature metaphysics (e.g. in *The Principles of Philosophy*; or, *The Monadology*, written in 1714, but not published until 1720), primitive active force is identified with appetite, while primitive passive force is associated with the lack of clarity and distinctness in our perceptions.

Derivative forces, by contrast, are invoked to explain the specific properties of bodies.²¹ Derivative active force is said to constitute a body's impetus as well as its dead and living forces, while derivative

¹⁹ I do not mean to suggest that Leibniz requires that the mind that represents entities as standing in relations is distinct in kind from the entities so represented. Indeed, the contrary is the case, since Leibniz holds that every monad represents every other.

²⁰ It is important to note that the mind need neither be conscious of this nor form an intention to do so, for it to occur. Also, sense perception also contains an element of passivity, in addition to the activity being emphasized here.

²¹ Derivative forces are not specific to physical properties; they can be invoked in explanations of specific mental states as well.

passive forces are responsible for its impenetrability and resistance, or inertia. In this context, a derivative force is a particular state at one moment in time that is the cause of a physical state of a body at the next moment in time. What is supposed to make a derivative force derivative is the fact that it is a 'limitation', 'modification', or 'accidental variation' of primitive force. On occasion, Leibniz seems to think of a thing's primitive force as containing the enduring law of the series of its states, in which case a derivative force is an aspect of its present state that forms one member of that series. By understanding forces and laws in this way, Leibniz attempts to develop a physics of derivative forces that is compatible with his metaphysics of true unities.

One dimension of Leibniz's public philosophical position can thus be summarized as follows: By reflecting on Descartes's philosophy and raising objections to certain aspects of it, Leibniz is led to a novel position in metaphysics and physics. Rather than accepting Descartes's view that bodies are merely extension, Leibniz argues that bodies can be real only if true unities or metaphysical points exist. He articulates his conception of true unities further by arguing that they cannot be either material atoms or (mathematical) points, but rather are to be understood as minds, i.e. unities endowed with representational forces. Understanding true unities in this way then gives Leibniz the ability to explain how they can bestow unity on something that does not have it on its own, because minds can actively impose an accidental unity on a plurality of entities on the basis of some relation that minds represent their properties as standing in. Leibniz fills out this conception by advancing a dynamical physics according to which the active and passive forces that are the specific causes of the states of bodies are derivative from the more general, primitive mental forces of the true unities he had originally posited in response to Descartes's view.

However, even if Leibniz has raised several objections to Descartes's position and presented a novel alternative to it, a number of questions naturally arise regarding the precise details of his own account. The first question derives from noting that Leibniz's argument was designed to show merely that extended bodies could be real, despite their infinite divisibility, only if indivisible metaphysical points exist. However, since Leibniz conceives of these metaphysical points as mindlike, and

holds that minds can bestow unity and thus reality on bodies only if the latter are understood as merely phenomenal or ideal, he ends up having to deny the reality of bodies in attempting to save their reality. Is there no way of avoiding such a paradoxical-sounding conclusion?²²

Second, if *primitive* force is perceptual or *mental*, how exactly are any of the derivative forces that cause the *physical* states of bodies to be derived from it? That is, how does Leibniz overcome a slightly different version of the problem concerning the heterogeneity of the mind and the body that he had raised against Descartes? Granted, Leibniz does not explicitly characterize the relationship between primitive mental forces and derivative physical forces as a *causal* relationship between heterogeneous *substances*, but the physical forces are supposed to be *derivative* from mental forces, and the lack of proportionality between these forces could seem to threaten the intelligibility of the derivation relationship just as Leibniz thought it did that of the causal relation in Descartes's case.²³

Third, if the derivative forces of bodies are essentially *relational* and the primitive forces of minds necessarily *intrinsic*, then how exactly do the latter give rise to the former, especially if the primitive forces of minds are supposed to serve only as general causes and thus are not to be appealed to in explaining specific changes in bodies?²⁴ It is true that Leibniz can appeal to the representational activity of minds

²² The paradoxical ring here arises not simply from the fact that bodies, understood merely as extended beings, cannot, according to Leibniz's argument, be substances as such (and thus fundamentally real), but must rather be derivative, which can seem to contrast with what Descartes might naturally have meant by saying that something is real. One could remove that paradox simply by distinguishing, as Leibniz does, between different kinds of reality: fundamental reality (which is reserved for substances) and derivative reality (which applies to extension and the other accidents of substances). The paradox also arises from the fact that the ultimate ontological status of bodies is mental rather than physical, according to (the later) Leibniz's position. Using the term 'paradox' is meant here to indicate not any contradiction in the resultant position, but rather that there is a way of stating how the dynamics of Leibniz's argument leads the Cartesian to a position that is quite distant (e.g. at least two steps removed) from the original point at which it starts, since his argument requires denying that one can attribute to extension the privileged ontological and explanatory roles that were important to Descartes. In short, despite Leibniz's way of stating his objection, very little of Descartes's position can be saved if it is correct.

²³ In short, the problem here is that it is difficult to make sense of how (and why) physical bodies are to reduce to mental entities, given their different properties and laws.

²⁴ For discussion of this question about Leibniz's account of the relation of primitive and derivative forces, see Adams, *Idealist*, 378–99. Especially relevant is Adams's remark: 'There

to explain how relations between distinct entities are represented, for, as we saw above, a mind can relate several different things by taking them together and relating them to each other on the basis of their intrinsic properties. However, even granting Leibniz this point, it is still the case that such relations are intrinsic to each monad, because appealing to the activity of monads in this way explains only how a mind *represents* relations, and not how such relations could actually exist between distinct things. As a result, actual relations between distinct entities could seem to remain unaccounted for on Leibniz's account.

These three lines of inquiry can be combined into one densely packed question: How do the unchanging unities that represent the world by means of activities that are intrinsic to them ground (or render intelligible) changing physical relations between extended bodies? Unfortunately, Leibniz does not provide an explicit answer to the various aspects of this question—at least not to the wider reading public at the time.²⁵

2. WOLFF

Christian Wolff, who corresponded with Leibniz for over a decade (from 1704 to 1716), is often credited with popularizing Leibniz's position in the first half of the eighteenth century in Germany, but he is also frequently blamed—or at least looked down upon—for not having a proper or full appreciation of Leibniz's views. In this section, I argue that investigating Wolff's discussion of the necessity and nature of simples is quite instructive in a number of ways, giving us a far more accurate and also interesting insight into Wolff's actual contributions.

may well be serious problems here, but there is little evidence that they troubled Leibniz' (p. 381).

²⁵ It is undeniably true that the reception of Leibniz's thought in Germany throughout the 18th century was heavily influenced by restrictions on which of his writings were publicly available. However, these restrictions did not, or so I shall argue below, prevent his successors from lodging well-motivated criticisms of his views and from developing alternative positions, especially concerning those points that come up for discussion in the concluding section. This is not to say that their criticisms are ultimately successful or that their alternative views are preferable to Leibniz's, but rather merely that they understand certain aspects of his position well enough that their remarks are worthy of serious consideration.

For one, Wolff both articulates Leibniz's argument for the necessity of simples in greater detail and develops a novel and more powerful argument for the same conclusion on the basis of premisses that Leibniz explicitly accepted. For another, Wolff decides not to follow Leibniz in thinking that all simple substances must be monads, i.e. endowed with the force of representation, for a complex set of plausible reasons. Not only does Wolff think that Leibniz has not produced an argument that would actually support such a counter-intuitive claim, but he can also use the consequences that follow from being agnostic about the nature of simple substances to his advantage in addressing two of the questions that naturally arose for Leibniz's position.

Wolff first presents an argument for the necessity of true unities, or simples, near the beginning of his systematic metaphysics in his *Rational Thoughts on God, the World and the Soul of Human Beings, Also All Things in General* (which was published in 1719–20), only a few sections after his infamous attempt to derive the principle of sufficient reason from the principle of non-contradiction. Moreover, Wolff's argument is closely related to Leibniz's. In §76 of *Rational Thoughts*, Wolff presents the argument as follows:

If there are composite things, there must also be simple beings. For if no simple beings were present, then all parts—they can be taken to be as small as you might ever like, even inconceivably small parts—would have to consist of other parts. But then, since one could provide no reason where the composite parts would ultimately come from (*keinen Grund anzeigen könnte, woher denn die zusammengesetzten Theile endlich herkämen*), just as little as one could comprehend where a composite number would arise from if it contained no unities in itself, and yet nothing can be without a sufficient reason (§30), one must ultimately admit simple things from which the composites arise.²⁶

Formalized, Wolff's argument for simples runs as follows.

P1: Either there are simples or everything is composite.

C1: If there were no simples, then everything would be composite.
(from P1)

²⁶ Christian Wolff, *Vernünfftige Gedancken von Gott, der Welt und der Seele des Menschen, auch allen Dingen überhaupt* [*Vernünfftige Gedancken*] (Halle, 1724); repr. of the 11th edn. in Wolff, *Gesammelte Werke*, division 1, vol. ii (Hildesheim: Georg Olms, 1983), §76, p. 36.

- P2: If everything were composite, then all parts of a composite would in turn be composite and therefore divisible into further parts.
- P3: If all parts of a composite were divisible into further parts, there would be no ultimate reason for the (existence of the) parts.
- P4: There must be an ultimate reason for the (existence of the) parts. (principle of sufficient reason)
- C2: There are simples. (via an extended *modus tollens* from C1, P2, P3, and P4)

Wolff's argument clearly sides with the version of Leibniz's argument in the 'New System' that stressed the infinite divisibility of matter rather than the distinction between the continuity of matter and the discreteness of reality. His argument might seem to differ from this version of Leibniz's argument in so far as Wolff appeals to the principle of sufficient reason, whereas Leibniz invokes the idea that the reality of a collection depends on the existence of simples (and, in turn, on the idea that only what is truly *one* being is truly *one being*). However, this difference is, I think, ultimately merely apparent. For as we saw in Leibniz's explanation of the distinction between being *per se* and being *per accidens*, the true unities required by Leibniz's argument end up providing the *reason* for the accidental being of the collection. Granted, Wolff's way of putting the point (in terms of 'where parts come from') may not be particularly clear, but I see no fundamental difference here that is of importance.

Moreover, later, in *Philosophia prima; sive, Ontologia*—his more detailed Latin treatment of ontology, published in 1728—Wolff continues to endorse the argument Leibniz had introduced against Descartes, for in §686 of that work he asserts:

If there are composite beings, then there must also be simple beings, or, without simple beings composite [beings] cannot exist. For composite beings are composed of parts that are distinct from each other mutually (§531). But if those parts were composed once more of parts that are distinct from each other mutually, then they, too, would be composite beings (§531). Therefore, as long as other, smaller parts are admitted from which larger parts are composed, the question

continuously arises, whence they are composed, consequently, it is not yet intelligible, whence, in the end, the smallest composite beings result that make up the composition of the other composites. Because, in this way, the sufficient reason is not contained in the notion of the composite, why it is composed (§56), yet a composite being cannot exist (§70) without a sufficient reason why it is a composite being rather than not a composite being, the sufficient reason of a composite being is to be sought outside the composite being, and therefore in a simple being (§665). If, therefore, composite beings should exist, simple beings must exist as well, or, without simple beings, a composite being can neither be conceived nor exist.²⁷

However, Wolff's way of stating the argument has an important advantage over earlier formulations in so far as it reveals a serious weakness in the argument, namely, that it ignores the possibility that composition itself might contain the reason for a composite being.

Fortunately, in other passages in the *Philosophia prima; sive, Ontologia*, Wolff can be read as addressing this weakness. In §533 Wolff asserts: 'The essence of a composite being consists in the way in which such parts are combined with each other.'²⁸ Then, in a later series of paragraphs from a section titled 'On the Modifications of Things, Especially Simple', he argues as follows:

§789 *The essence of a composite being consists in mere accidents. ...*

§791 *Accidents cannot exist without substances. ...*

§792 *There is nothing substantial in a composite being other than simple beings.* For the essence of a composite [being] consists in mere accidents (§789), consequently because nothing can pertain to a composite [being] unless the reason of it is contained in its essence (§168), everything else that pertains to the same [composite being] is an accident (§785). Because nevertheless accidents cannot exist without substance (§791), there must be something substantial beyond the essence. Wherefore because composite [beings] cannot exist without simple beings (§686), simple beings are what is substantial in them, and therefore there is not anything substantial in a composite being other than simple beings.

²⁷ Christian Wolff, *Philosophia prima; sive, Ontologia* [*Ontologia*] ([Frankfurt and Leipzig], 1736); repr. in Wolff, *Gesammelte Werke*, division 2, vol. iii (Hildesheim: Georg Olms, 2001), 517–18.

²⁸ Ibid. 416.

§793 *There are no substances other than simple substances & composite beings are aggregates of substances.*²⁹

Wolff's argument here can be formalized as follows.

- P1: The essence of a composite being consists in the way in which its parts are combined.
- P2: The way in which the parts of a composite being are combined is an accident.
- C1: The essence of a composite being consists in an accident. (from P1 and P2)
- P3: Accidents cannot exist without substance.
- C2: The essence of a composite being cannot exist without substance. (from C1 and P3)
- P4: The substance required for the essence of a composite being is either composite or simple.
- P5: If the substance required for the essence of a composite being were composite, its essence would consist in an accident, which would therefore not in fact be a substance.
- C3: The essence of a composite being cannot exist without a simple substance. (from C2, P4, and P5)
- P6: A composite being (and its essence) exist(s).
- C4: A simple substance exists. (from C3 and P6)

This argument excludes the possibility that *composition alone* could contain the reason for a composite being, which allows Wolff to infer that the reason for a composite being must lie, at least in part, in the *simple beings* that make it up. And the key ideas that allow him to draw this conclusion are that composition is a relation and that relations—at least composition relations—are accidental and thus require something substantial, which can therefore only be something simple, since everything that is not simple is composite and hence accidental.

Whatever one makes of this argument, what is important for our purposes is to note how it goes beyond the argument introduced by Leibniz (and initially reaffirmed by Wolff in one of its versions). Leibniz's formulation of the argument in the 'New System' focused on how the (infinite) divisibility of a (continuous) spatial magnitude

²⁹ Ibid. 592–4.

is incompatible with the (discrete) unity required for being. Wolff's present argument, by contrast, embarks on a new line of reasoning by considering the accidental nature of composition and by assuming that accidents require substantiality.³⁰

Despite the fact that Wolff's argument goes beyond what Leibniz explicitly asserts in print, it is noticeable that Wolff's 'new' argument is based not on principles completely foreign to Leibniz's system, but rather on resources already contained in Leibniz's position. For Leibniz does explicitly hold that composition is a contingent form of unity that can bestow only an accidental being on a plurality of entities. As a result, Wolff is not genuinely breaking with Leibniz, much less misreading Leibniz's position. Instead, he can be read as making more efficient use of the resources implicit in Leibniz's account, since his new argument broadens the scope of the views that are vulnerable to attack. For this argument applies not merely to those who accept a Cartesian account of body as consisting in extension alone, but also to anyone who accepts that bodies are composed of parts, since in the latter case features in addition to extension could be attributed to bodies, attributions that are ruled out by Cartesian conceptions. That is, this argument reveals more clearly what the fundamental issue is, namely not the narrowness of Descartes's conception of extension *per se*, but rather substantiality and its importance for the kind of composition that is proper to bodies.

Moreover, Wolff's understanding of the *nature* of the simples required by the arguments presented above is likewise different from Leibniz's in a subtle but important way. Whereas Leibniz, as we saw above, asserts that all unities or simples are like minds in so far as they have the power to represent the world (with varying degrees of

³⁰ Wolff's argument is different in so far as it turns on the distinction between accidents and substances and not simply on the relation between plurality and unity. In fact, though Wolff was presumably not aware of it, Leibniz suggests this argument briefly in a letter to Arnauld, 30 Apr. 1687: 'It also seems that what constitutes the essence of a being by aggregation is only a mode of the things of which it is composed. For example, what constitutes the essence of an army is only a mode of the men who compose it. This mode therefore presupposes a substance whose essence is not a mode of a substance' (Leibniz, *Essays*, 86). Perhaps surprisingly, Leibniz immediately continues on—without any break—with an argument based on the identity of being and unity.

clarity and distinctness), Wolff is agnostic about whether *all* simples must have such a power.

Now that I have distinctly established that the internal state of every simple thing refers to all the rest that exist in the world (§596) and Herr von Leibniz explains this in such a way that the whole world is represented in each simple thing according to the point where it is (§599), one can also understand further how everything in the world down to the smallest thing harmonizes with every other according to his opinion, and accordingly what he advances with his universal harmony of things, which, like all the rest that he has presented in this regard, appears to many as a puzzle that they believe to be unsolvable, since he has *neither explained nor proved it sufficiently*. However, because at the present time we *do not want to decide* what it really means for the inner state of simple things to refer to everything in the world, we shall let it *remain undecided* for the present in what the universal harmony of things consists, and it is enough for us that we have shown that it is present and that it can be explained in an intelligible manner according to the sense of Herr von Leibniz.³¹

Given the absence of any clear proof and the lack of an awareness of the internal state of other simples, Wolff is, at least ‘for the present’, agnostic about the nature of simples. In his so-called *Notations on Rational Thoughts* (*Der vernünftigen Gedancken von Gott, der Welt und der Seele des Menschen, auch allen Dingen überhaupt, anderer Theil, bestehend in ausführlichen Anmerckungen*), which was published in 1724, only a few years after *Rational Thoughts*, and which contains comments on some of its most important and controversial paragraphs, Wolff explicitly notes that he had asked Leibniz for a proof of monads, but that Leibniz, who had claimed that he could provide a proper demonstration, never actually did so.³² Wolff then comments that while he accepts that Leibniz has demonstratively proved the existence of simple things whose forces are responsible for their own changes, he still does ‘not yet see the necessity of why all simple things must have one and the same kind of force and suspects rather that a force would have to be found in the elements of corporeal things from which the forces of

³¹ Wolff, *Vernünftige Gedancken*, §600, pp. 370–1; my emphasis.

³² Leibniz has more to say about why true unities are minds than Wolff acknowledges, but this discrepancy may be due to the fact that Leibniz’s most explicit views on the topic were not available to Wolff.

bodies ... can be derived in an intelligible manner'.³³ Wolff thus grants that at least some simples, namely souls, have the power to represent the world, but he notes that it has not yet been proved that all simples must have such a power, explicitly leaving open the possibility that some simples, e.g. those that underlie bodies, might have a different kind of intrinsic quality or primitive force. Moreover, Wolff explicitly recognizes—in a way reminiscent of the motivation underlying the second question raised in the previous section for Leibniz—that it would be advantageous if the simples of corporeal things were of such a nature that one could also derive the forces of bodies from them in an intelligible way.

If Wolff is agnostic about the nature of simples from 1719 to 1724, does he commit himself on the issue at a later time? In his *Philosophia prima; sive, Ontologia*, Wolff provides a lengthy list of characterizations of simples: as what have no parts, as indivisible, as not extended, as lacking size and shape, as not filling a space, as incapable of internal motion, as different from composites, and as being either necessary or, if contingent, then arising instantaneously owing to a necessary being *ex nihilo* and perishing instantaneously via annihilation.³⁴ In his Latin treatment of rational cosmology, *Cosmologia generalis*, first published in 1731, Wolff adds that 'Zenonical points are not the [simple] elements of material things' (§217), where Zenonical points are identified with mathematical points.³⁵

What stands out about Wolff's later characterizations of simples is that they are almost exclusively negative and are generated by way of contrast with the properties of composite bodies. It is true that he provides more extensive analyses and arguments in his *Philosophia prima; sive, Ontologia*, but the characterizations of simples in these

³³ Christian Wolff, *Der vernünftigen Gedanken von Gott, der Welt und der Seele des Menschen, auch allen Dingen überhaupt, anderer Theil, bestehend in ausführlichen Anmerkungen* ([Halle], 1724); repr. in Wolff, *Gesammelte Werke*, division 1, vol. iii (Hildesheim: Georg Olms 1983), §215, p. 369.

³⁴ These features of simples are defended and elaborated in *Ontologia*, §§673–702, pp. 511–29. Several of them are repeated in *Cosmologia generalis* ([Frankfurt and Leipzig], 1737); repr. in Wolff, *Gesammelte Werke*, division 2, vol. iv (Hildesheim: Georg Olms, 1964), §§182–5, esp. 184, pp. 146–8.

³⁵ Wolff's argument against simples being identified with mathematical points is different from Leibniz's (as presented above). For Wolff argues that mathematical points are not different from each other, whereas the simple elements of material bodies must be different (§216).

contexts are typically functional characterizations (such as that a simple must contain the sufficient reason for its next state), which do not give insight into the features simple substances have that would allow them to carry out their functions.³⁶ As a result, though Wolff accepts that simples must be endowed with a force, he is ultimately agnostic about the specific nature of the force and thus of the simple endowed with it.³⁷ As he remarks in the *Cosmologia generalis*: ‘And from this it is clear why we do not inquire into the specific difference between the elements and other simple substances, and why we gladly relinquish the opinions of Leibniz regarding monads.’³⁸

At this point, one could grant that Wolff’s agnosticism about the nature of simples is different from Leibniz’s position, but hold that this difference is ultimately insignificant. After all, in §600 of *Rational Thoughts* Wolff implicitly leaves open the possibility that Leibniz could be right about all substances having the power to represent the world. Further, the basic structure of his account of physics in the *Cosmologia generalis* is similar to Leibniz’s. For he argues that the specific properties of bodies—e.g. size, shape, and motion—are to be accounted for in terms of motive force and the force of inertia, which he explicitly characterizes as derivative active and passive force, respectively, just as Leibniz does. Thus, it might appear as if the differences between Leibniz’s and Wolff’s positions on the nature of simples are unimportant to their broader accounts and can thus be disregarded.

However, such a view would mislead in unfortunate ways. For Wolff’s agnosticism about the nature of simples does have important ramifications by placing significant limits on the kinds of explanation that involve these simples. Instead of being able to call on specific features of the representations that monads have (e.g. their degree of clarity and distinctness or the spatial features of the objects represented), Wolff is restricted to asserting merely that simples have some sort of intrinsic quality that distinguishes them. Specifically, this restriction makes an immediate difference to Wolff’s explanation of space. Leibniz’s explanation of space can be quite simple, at least

³⁶ See Wolff, *Cosmologia generalis*, esp. §§195–214 and §§703–95.

³⁷ See *ibid.*, §196, for an explicit argument for the claim that simples are endowed with ‘a certain force’ (p. 152).

³⁸ *Ibid.*, §243, p. 186.

in principle.³⁹ Space arises because monads' representations are, to a certain extent, confused. It is a limitation or imperfection of minds that they represent objects as spatially extended, when what is ultimately real is not. Moreover, because Leibniz explicitly adopts the 'world apart' doctrine, according to which I would have the very same representations I do even if only God and I existed, it follows that only the representations of a single finite monad are required to account for (my representation of) extension.

Wolff's explanation of extension, by contrast, requires a plurality of simples. In §602 of *Rational Thoughts*, he says of simples that,

since each one of them refers to the rest in a special way according to its internal state (§595), it coexists with the rest in a special way such that none of them can exist with the rest in precisely this way. And thus not only is each one external to the others (§45), but many, taken together, also follow each other in an order (§132, 133), and thus many, taken together, fill a space (§46), although each one of them does not actually fill a space, but rather only has a certain point in it.

Wolff's argument here is that since the intrinsic qualities of simples, when taken together, stand in an ordering relationship and since space is nothing other than a certain ordering relationship, space is to be identified with the ordering relationship between the intrinsic qualities of simples.⁴⁰

³⁹ In fact, Leibniz seems to have two separate lines of thought about space. On the one hand, in his correspondence with Clarke, Leibniz seems to hold that our representation of space is formed through abstraction, based on relations among bodies that we perceive existing in the world. On the other hand, in his correspondence with Des Bosses (5 Feb. 1712), for example, he clearly distinguishes between our subjective phenomena and the 'phenomena of God', *scientia visionis*, and holds (as he does in the *New Essays* as well) that both space—the order of coexisting things—and time—the order of successive things—are represented by God through innate ideas (in which we partake in so far as we have apodictically certain geometrical knowledge).

⁴⁰ Wolff provides essentially the same line of reasoning in his *Cosmologia generalis*, arguing that since the elements of material things are different (§219) and united to each other (§220), extension arises when they are aggregated (§221), given that extension is entailed by a plurality of distinct coexistent entities (*Ontologia*, §548). In neither treatise does Wolff's argument explain why spatiality rather than some other kind of relationship is required by the order that happens to exist between simples, but Leibniz's argument is not significantly different on this point, since the mere fact that monads must represent the world in ways that are not completely clear and distinct does not obviously entail spatiality rather than some other confused mode of representation. As a result, both Leibniz and Wolff can be understood as making the valid point that, given spatiality, one can provide at least a partial

Wolff's argument thus shows that his account of space, or extension, relies on the relation between simples rather than simply on the (representational) nature of the simples as Leibniz's might seem to. Moreover, this point is supported by Wolff's explicit account of the essence of composite entities in §789 of the *Prima philosophia; sive, Ontologia*, where, as we saw above, he asserts that the essence of a composite entity consists in mere accidents. But this same point applies not merely to extension (which obviously contains a plurality of distinct coexistent entities), but also to bodies and to their most basic properties as well, such as size (magnitude) and shape (figure). For bodies are not merely extended, but are themselves composite entities, whose essence and properties likewise depend on the accidental or contingent relations among the simple elements that constitute them, rather than only on the specific nature of such simple elements.⁴¹ Also, since Leibniz denies that one should use the true unities 'to explain the particular problems of nature', it is open to Wolff as well to deny that the nature of the simples can be used to explain any features of the composites that they constitute.⁴² As a result, Wolff's agnosticism about the nature of simples has important implications for several issues within his broader metaphysics and physics.

We have thus seen that Wolff's position differs from Leibniz's with respect to the nature of the simple elements that compose bodies and also with respect to the way in which simples figure into explanations of the nature and properties of bodies. And we have also seen that these differences are not based on a crude misunderstanding of Leibniz's position, but rather on Wolff quite reasonably not wanting to base his own philosophy on a claim about the nature of simples that lacks sufficient argumentative backing.⁴³ In light of these differences, one can

explanation of it in terms of non-extended simples, whether in terms of their intrinsic (representational) qualities or in terms of the order between their intrinsic qualities.

⁴¹ See Wolff, *Cosmologia generalis*, §140, for his account of the essence of composite bodies.

⁴² Leibniz, 'New System', in Leibniz, *Essays*, 139. In §243, Section II of the *Cosmologia generalis*, where Wolff is explaining the origin of bodies from the simple elements, he explicitly asserts that the qualities of the elements of material things should not be used in natural philosophy.

⁴³ Wolff may not have fully come to terms with the issues that Leibniz refers to as constituting the labyrinth of the continuum, and thus he may not be as clear as Leibniz was about the relations among unities and space, but Wolff's account of how unities and space

now consider whether Wolff might be able to offer different responses to the three questions that were posed above for Leibniz's account.

First, because the simples (or true unities) that Leibniz posited to explain bodies are minds, he is, as we saw above, paradoxically forced to deny the reality of bodies in attempting to account for the reality of bodies. Since Wolff, by contrast, does not assert that the simples that constitute bodies must be minds, he is not immediately forced into the same position. For if not all simples are endowed with the force of representation, then the bodies that are constituted by such non-mental simples (or the relations between them) need not for that reason be ideal and the reality of bodies could be maintained. Granted, Wolff's agnosticism about the nature of simples can entail only agnosticism about the ontological status of bodies, but even such a modest difference could be a welcome result.⁴⁴

This alleged advantage notwithstanding, one might still object that, compared to Leibniz's position, Wolff's agnosticism has a significant cost for the following reason. As we saw above, Leibniz's explanation of how one entity can bestow unity and thus reality on something else depends on the specific nature of the entities that have unity intrinsically and being *per se*. For it is because a mind perceives (or at least represents) a certain relation among a number of entities that they could be aggregated and thus viewed as a unified collection. The unity (and hence being) of the collection was thus merely accidental rather than intrinsic (and *per se*), but it is clearly significant that Leibniz can give an intelligible explanation of how an entity that lacks being *per se* could nonetheless have unity bestowed upon it and thus be given being *per accidens*. But given that Wolff cannot rely on the mental features of simples, he cannot simply repeat Leibniz's explanation of how minds can bestow accidental unity and reality on bodies.

While it is true that Wolff cannot adopt every detail of Leibniz's explanation of how simples can bestow unity on bodies, he can and,

are related may also lack detail sufficient to bring out significant differences between their positions. For a helpful account of this issue in Leibniz, see the Introduction by Richard Arthur to *The Labyrinth of the Continuum: Writings on the Continuum Problem, 1672–1686*, ed. and tr. R. Arthur (New Haven: Yale University Press, 2001), pp. xxiii–lxxxviii.

⁴⁴ See Wolff, *Psychologia rationalis* ([Frankfurt and Leipzig], 1740); repr. in Wolff, *Gesammelte Werke*, division 2, vol. vi (Hildesheim: Georg Olms, 1972), §§36–7, pp. 550–1, and 614, for his discussion of materialism and idealism.

on some points, does tell a story that is similar to it in fundamental respects. Specifically, although Wolff does not explicitly draw Leibniz's distinction between being *per se* and being *per accidens*, he does assert that the essence of a composite consists in the contingent relations between its constituent parts, which is one of the main features of Leibniz's account.⁴⁵ What Wolff cannot endorse is Leibniz's claim that these contingent relations must be represented by a mind, but he could argue that this particular claim is not an *essential* part of an account of how simples (i.e. entities that have intrinsic unity) can bestow unity on entities that lack it as such (e.g. bodies). For he could hold that what explains the special status of something that has unity through something else and hence being *per accidens* is not the fact that it is represented by a mind, but rather the fact that its unity stems from its accidental, or contingent, relations. That is, from Wolff's perspective, Leibniz's claim that a mind represents entities as related in a certain way is an unnecessary element of an explanation of how composite bodies could have an accidental unity, an element that is also not required by Leibniz's idealist commitments, even though it fits in with them quite naturally. Accordingly, Wolff's agnostic stance on the nature of simples does not prevent him from adopting a broadly Leibnizian account of how they can bestow (an accidental) unity on composite entities, such as bodies, that lack intrinsic unity. In short, Wolff has no obvious disadvantage here, and, in fact, would even seem to have a modest advantage in so far as he is in a position to avoid the paradox that Leibniz faces.

Second, as we saw above, Leibniz's account encounters the following question: If true unities are perceptual or *mental*, how exactly are any of the *physical* states of bodies to be derived from them (given the heterogeneity of the mental and the physical)? Now Wolff might seem to have a quick and easy answer to this question, since simples, for him, are not necessarily mental, and he is not thereby committed to a heterogeneous derivation relationship between the mental and the physical. In fact, as we saw above, he explicitly acknowledges the desirability of being able to understand physical derivative forces on the basis of primitive forces. This advantage seems to disappear just as

⁴⁵ That Wolff does not explicitly draw the distinction between being *per se* and being *per accidens* may be due to the fact that the *New Essays* were not published until 1765.

quickly as it arose, however, when one recalls that Wolff denies that simple elements have any of the same properties as material bodies—at least in so far as ‘the elements of material things are not extended, are not endowed with shape and magnitude, fill no space, and are lacking in internal motion’.⁴⁶ Even if Wolff’s simples may not be mental, they also cannot be physical *in the same sense* in which bodies are, and therefore providing an intelligible explanation of how something that is not physical is supposed to give rise to something else that is, would seem to remain as serious a difficulty for him as for Leibniz.⁴⁷

However, even if Wolff’s agnosticism about the nature of simples as such does not provide an answer to the second question raised for Leibniz’s original position, a consequence that follows from it can. Recall from above that one of the consequences of Wolff’s agnosticism was that both spatial extension and the physical properties of bodies were to be explained not directly through the intrinsic features of simple substances (since Wolff is agnostic about them), but rather in terms of *relations* between these intrinsic features. But if the relations between the intrinsic features of simple substances can plausibly be understood as physical, then an explanation of the physical properties of bodies in terms of the relations between the intrinsic features of simple substances can amount to a connection between homogeneous entities, which can therefore be proportional and hence intelligible. In this way, Wolff’s agnosticism can also have a significant indirect pay-off.

Finally, there is also the difficulty of explaining how the *intrinsic* features of simple substances are supposed to generate the *relational* properties of bodies. Unfortunately, Wolff’s agnosticism about the nature of simples is of no significant help here, either directly or indirectly. That is, even if one asserts merely that simples have some unknown kind of intrinsic property, it remains unclear how relational properties between simples are supposed to arise. To see how Wolff skips over the difficulty, recall his account of the origin of space

⁴⁶ *Cosmologia generalis*, §184, p. 147.

⁴⁷ If one accepts this conclusion, one is essentially weakening the derivation and hence intelligibility relationship between the primitive and derivative forces, a strategy Paul Lodge pursues in ‘Primitive and Derivative Forces in Leibnizian Bodies’, in H. Poser and E. Knobloch (eds.), *Nihil Sine Ratione. Mensch, Natur und Technik im Wirken von G. W. Leibniz* (Hanover: Gottfried Wilhelm Leibniz Gesellschaft, 2001), 720–7, by claiming that the derivation relation is not an inheritance relation (despite the examples that Leibniz uses to illustrate the distinction, such as point to line).

from the simple elements. On his account, since space is simply a unity of a plurality of coexistent things and since a plurality of simple elements stand in a certain ordering relationship in virtue of the intrinsic qualities of each, the ordering relationship is supposed to generate space. However, this begs the question in so far as it simply assumes that there must be an ordering relation between the intrinsic properties of the simple elements. For one, Wolff has not established that all simples have an intrinsic property of the same kind (as, for example, objects must all have some size in order for the 'taller than' relation to obtain). For another, even if every simple element did have an intrinsic property of the same kind (but with a different degree), it is still not clear that any order or relation between them is generated, given that Wolff has not established that and, more importantly, how these intrinsic properties must be 'taken together'. Why would they not be 'worlds apart'?

One might think that Leibniz has a slight advantage on this point in so far as the representational activities of his monads could, as we saw above, be construed as 'taking' several distinct entities 'together' and representing them as related in some respect. However, given the challenge Leibniz faces in providing a genuine sense in which distinct entities are actually related, and not merely represented as such, this advantage may well be merely apparent. For in the end, regardless of the specific nature of simple substances, it is difficult to see how the simples that are constituted by their intrinsic activities alone could ground relational properties of the kind that bodies have. Leibniz and Wolff face, it seems, similar difficulties on this point.

By investigating Wolff's arguments concerning the necessity and nature of simples, we have seen that his reaction to Leibniz's position is both sophisticated and insightful. He agrees with Leibniz that there must be simple substances and, early on, endorses one version of Leibniz's argument in support of that claim, but, upon further reflection and when faced with a significant objection to that argument, develops a second argument that is also broader in scope, while still being based on aspects of Leibniz's position. Further, since Wolff does not think that Leibniz has presented an argument establishing that the true unities or simple elements that are required for composite bodies *must* be minds, he is agnostic on the issue. But his agnosticism on the nature of simples is not simply a sign of a desire to avoid overstating conclusions,

but also brings with it, as a consequence, several further differences between Leibniz's position and his own, especially regarding the way in which simples are invoked in explanations of the derivative phenomena of bodies. In particular, we saw that these differences helped to provide partial answers to several of the questions that naturally arise for Leibniz's position regarding simples and their place in his metaphysics. By illustrating in this way how one could reasonably be led to articulate a point of view that is slightly different from Leibniz's own while still remaining within a distinctively Leibnizian framework, Wolff's position represents an intelligible and, in fact, quite illuminating response to the situation that he encountered in his attempt to develop a comprehensive metaphysical system after Leibniz's death.

3. BAUMGARTEN

Alexander Baumgarten is relatively well known for his views on aesthetics, but his views on theoretical philosophy have fared much less well, typically receiving attention owing to the fact that Kant had used Baumgarten's *Metaphysica* (originally published in 1739) as a textbook for several decades, which gave rise to the hope that one could make sense of Kant's peculiar terminology by finding a clearer precursor. What is of interest in the present context, however, is Baumgarten's position on the necessity and nature of simples.

Baumgarten's argument for the necessity of simples represents an interesting twist on Leibniz's and Wolff's strategies. Whereas Leibniz and, at least initially, Wolff considered the implications of the spatial divisibility of bodies and the way in which unity is a requirement of reason for being, Baumgarten focuses exclusively on the nature of composition. After stating (in §224) that a composite thing is (by definition) a whole of parts outside of (*extra*) parts, he argues:

§231. Every part of a composite substance is either something substantial or something accidental. Accidents cannot exist outside of what is substantial (§196). Therefore, substantial parts of a composite substance are posited outside of each other.⁴⁸

⁴⁸ Alexander Baumgarten, *Metaphysica*, 4th edn. (Frankfurt, 1757; first pub. 1739); repr. in Kant, *Gesammelte Schriften*, ed. Königlich Preussische Akademie der Wissenschaften (Berlin: de Gruyter, 1902–), xv. 5–54, xvii. 23–226, at 78; translations are my own.

Though Baumgarten's argument is extremely compressed, the basic idea is that a composite substance (such as a body) must be composed of at least some simple substances, since if it were not, then it would be composed exclusively of accidents, which is impossible, since accidents cannot exist independently of a substance.⁴⁹ It can be formalized as follows:

- P1: A composite is a whole of parts outside of parts, i.e. parts that are distinct from each other.
- P2: The (ultimate) parts of a composite that are distinct from each other are either accidents or simple substances.
- C1: A composite is composed of parts that are either accidents or simple substances. (from P1 and P2)
- P3: If a composite were composed solely of parts that are accidents, accidents would exist without a substance.
- P4: An accident cannot exist without a substance.
- C2: A composite is composed of parts at least one of which is a simple substance. (from C1, P3, and P4)

Baumgarten's argument for simples represents the endpoint of a shift in strategy that is quite striking, but at the same time fully intelligible if one keeps in mind the different audiences Leibniz, Wolff, and Baumgarten were addressing and the diverse aims they pursued as a result. Because Descartes's position was highly influential during most of Leibniz's career (or at least during his relatively early years in Paris in the 1670s), one of Leibniz's most pressing tasks was to show that matter cannot be understood as Descartes had proposed, namely as a substance whose principal attribute is extension (and extension alone). As a result, to establish his own position, it would make sense for Leibniz to begin with the nature of extension and then exploit the metaphysical implications of extension's infinite divisibility.

Since the most significant opposition Wolff faced in Germany in the 1720s and 1730s was not Cartesians, but rather Pietists whose position was primarily inspired by theological concerns, his main task

⁴⁹ Not only is the argument compressed, but the explicit conclusion that he draws seems to go well beyond the point that there must be simple substances, since it claims that the (presumably simple) substances that compose a composite substance must be posited 'outside of each other' (*extra se*), which raises a number of further issues (e.g. whether that is to be understood as spatial or not).

was to articulate and promulgate a systematic philosophy based on reason.⁵⁰ Thus, although the argument that he adopted early on in his *Rational Thoughts* was essentially the same as one strand of Leibniz's, he highlighted the importance of the principle of sufficient reason. Later, however, after the heat of direct battle with the Pietists was past and he was able to lay out the details of his systematic metaphysics in his *Prima philosophia; sive, Ontologia*, he was not under pressure to emphasize the role of reason and could explore in greater detail the rational basis for the necessity of simples. In doing so, he was clearly tempted to accept the quick inference that composites must ultimately be composed of non-composites, but he also articulated further reasons for accepting simples that were different from Leibniz's explicit argument, even if they could be seen as arising naturally from certain aspects of Leibniz's position.

Baumgarten, by contrast, was mainly interested in presenting a skeleton of metaphysics in a textbook for students, and he therefore focused exclusively on what is minimally necessary to understand fundamental metaphysical principles adequately.⁵¹ Since simple substances belong to the first principles of ontology, he clearly had to develop an argument in support of them that does not draw on anything extraneous. He attempted to satisfy this demand by considering the ontological status of the distinct parts that are united in a composite, and the dependence of accidents on substances. Baumgarten's main focus thus departed from both Leibniz's and Wolff's. For an argument based on composition is more fundamental than what pertains to infinite divisibility, which is specific to spatiality (as Leibniz's argument was), and such an argument also did not need to rely

⁵⁰ For a more detailed account of the opposition Wolff faced from the Pietists and how he reacted, see Georg Volckmar Hartmann, *Anleitung zur Historie der Leibnizisch-Wolffischen Philosophie* (1737); repr. in Christian Wolff, *Gesammelte Werke*, division 3, vol. iv (Hildesheim: Georg Olms, 1973); Max Wundt, *Die deutsche Schulphilosophie im Zeitalter der Aufklärung* (Tübingen: Mohr, 1945); Eduard Zeller, 'Wolff's Vertreibung aus Halle. Der Kampf des Pietismus mit der Philosophie', *Preussische Jahrbücher*, 10 (1862), 47–72; Konrad Cramer, 'Zur geistigen Situation der Zeit der Göttinger Universitätsgründung 1737', in *Göttinger Universitätsschriften*, xii (Göttingen: Vandenhoeck & Ruprecht, 1988), 101–43; as well as my 'From Pre-established Harmony to Physical Influx: Leibniz's Reception in Early Eighteenth Century Germany', *Perspectives on Science*, 6 (1998), 136–203.

⁵¹ For a description of Baumgarten and the context in which he worked, see e.g. Bernhard Poppe, *Alexander Gottlieb Baumgarten. Seine Bedeutung und Stellung in der Leibniz-Wolffischen Philosophie und seine Beziehung zu Kant* (Leipzig: Buchdruckerei Robert Noske, 1907).

on considerations pertaining to what is contained in the essence of composition (as Wolff's later argument had).

What is even more interesting about Baumgarten's reflections on this particular issue, however, is his treatment of the nature of simples. Though Baumgarten agrees with Leibniz that all simple substances or monads have the power of representation, he also claims that monads are impenetrable:

§398. Each finite monad of this and any universe (§354), because it exists outside of all the rest that constitute the world with it (§192), cannot exist in the same total place along with any other (§282). *A substance whose place no other substance posited outside of it can occupy is impenetrable* (solid). Therefore, all substances, hence also all monads, of this and of every composite world are impenetrable (§230).⁵²

On the one hand, ascribing impenetrability to monads might seem to be wholly inappropriate. After all, monads might seem to be impenetrable in precisely the same (vacuous) sense in which, say, numbers are. Since numbers do not occupy any extended region of space at all, it necessarily follows that nothing else could push them out of any given region of space, but to say that they are therefore impenetrable is vacuous in so far as one is not ascribing any causal power or real property to them. If monads are simply immaterial minds (as Leibniz held), then the same conclusion would follow for monads as well. Something, one suspects, is seriously amiss here.

On the other hand, there is a textual and philosophical basis for Baumgarten's ascription of impenetrability to monads. Near the beginning of the 'Specimen dynamicum', Leibniz says that primitive passive force is that force 'by virtue of which it happens that a body cannot be penetrated by another body, but presents an obstacle to it'.⁵³ That is, one could naturally (even if mistakenly) interpret Leibniz as claiming that impenetrability is a primitive rather than a derivative force, making it reasonable to assert that monads are impenetrable.⁵⁴ Further, both Leibniz and Wolff relate monads or simple elements to

⁵² Baumgarten, *Metaphysica*, xvii. 110.

⁵³ Leibniz, *Essays*, 120.

⁵⁴ In retrospect, it is clear that such an interpretation does not reflect Leibniz's considered opinion. Impenetrability is a derivative force of bodies rather than a primitive force of monads—though impenetrability *depends* on the primitive forces of monads, which is all that this passage actually asserts.

points in space. In the ‘New System’, Leibniz remarks that the true unities or metaphysical points for which he had argued are associated both with particular organic bodies ‘by an immediate presence’ and with ‘points of view’ from which they represent the world.⁵⁵ As we saw above in the *Rational Thoughts*, Wolff similarly argues that each simple element ‘has a certain point in’ space in virtue of the order that exists between the intrinsic qualities of a plurality of simple elements. If monads or simple elements are immediately present in, or have a location at, particular points in space, then they are different from numbers in an important way, since numbers are not associated with particular locations in space. Moreover, this difference is crucial to whether impenetrability can sensibly be said to be involved in each case. For in the case of monads (or simple elements) that occupy points in space, one would need a reason to exclude the possibility that two of them could occupy the same point in space, and that reason would be provided by the impenetrability (or primitive passive force) of the relevant monads (or simple elements).

These reflections lead Baumgarten to an even bolder assertion in the section that immediately follows his assertion that monads are impenetrable:

§399. The monads of this and any composite, and hence extended, world (§241, 393) are POINTS (§286), but not MATHEMATICAL points, in which nothing other than the absence of extension is posited (§396–398). Nor, if placed next to each other (*iuxta se positae*), are they congruent or do they coincide (§70, 396). Rather, if a plurality of them have been posited as coexisting, since any given one of them is impenetrable (§398), they are placed simultaneously outside each other (*extra se*) in a certain order (§396, 78). Hence, in the aggregation of them is space. Therefore, every aggregate of monads of this and every composite world is an extended thing (§241). If a mathematical point, which is an abstract possibility, is imagined to exist, it is a ZENONICAL POINT, which is a fiction. If by a PHYSICAL POINT you mean an actual thing that is completely determined beyond its simplicity, then certain monads of this universe, namely those the aggregation of which is an extended thing, are physical points.⁵⁶

⁵⁵ For difficulties in attributing a single coherent view to Leibniz, see Daniel Garber, ‘What Leibniz Really Said?’ (unpub.).

⁵⁶ Baumgarten, *Metaphysica*, xvii. 110.

In this passage Baumgarten is reacting to Leibniz and Wolff in a novel way. On the one hand, he follows Leibniz and Wolff in asserting that monads cannot be mathematical or Zenonical points. Mathematical points are, as Leibniz claims, merely abstract possibilities and hence fictions, not realities. Nor are they identical if they are posited simultaneously, since monads are distinguished by their intrinsic properties. On the other hand, Baumgarten departs from Leibniz and Wolff by explicitly describing monads as *physical points*. That is, Baumgarten *identifies* monads with (physical) points, whereas Leibniz and Wolff simply *associate* monads or simple elements with points in space—for Wolff, for example, each simple element *has* a certain point, as opposed to *being* a certain point. Moreover, although the precise details of Baumgarten's line of reasoning have been left implicit in the text, it is obviously supposed to be based directly on the impenetrability of monads.⁵⁷

Baumgarten's position thus represents a significant departure from both Leibniz's and Wolff's. Leibniz's monads are metaphysical points, which he assimilates to minds, whereas Wolff is agnostic about the nature of his simple elements. Given Wolff's agnosticism, it is clear that he might not object to Baumgarten's position, even if he might not be persuaded by Baumgarten's argument for specifying the nature of simple substances as being physical. But what about Leibniz, who explicitly mentions physical points in the 'New System'? In the passage (quoted above) where Leibniz is discussing the nature of the true unities required by extended matter as consisting in metaphysical points, he remarks: 'But when corporeal substances are contracted, all their organs together constitute only a *physical point* relative to us. Thus physical points are indivisible only in appearance.' Unfortunately, Leibniz's remarks here are both brief and cryptic. He seems to be considering whether metaphysical points could be corporeal substances, and rejecting that possibility because corporeal substances can be represented as indivisible only if they are 'contracted.' That is, if one identified metaphysical points with corporeal substances, then it would appear that such substances would not be truly indivisible (given that organic corporeal substances would

⁵⁷ It is presumably because monads are impenetrable that they must be 'placed simultaneously outside each other in a certain order' and thus in different points in space.

be extended). In light of this difficulty, one might ‘contract’ or reduce corporeal substances down to physical points. This act of reduction would solve the problem of divisibility, but, Leibniz seems to be suggesting, it would do so at the cost of their reality, since such points would be indivisible ‘only in appearance’. Leibniz’s argument excludes in this way the possibility that metaphysical points could be corporeal substances.

However, if this passage from the ‘New System’ is to be read in this way, then it turns out that Leibniz does not even consider Baumgarten’s suggestion that the true unities required for extended matter could be actual physical points. That is, since Leibniz discusses only the possibility that organic corporeal substances could be treated *as if* they were physical points, there is no evidence that he ever entertained the view that monads are simply real, indivisible physical points. And even if he had been aware of this view, it is not clear that he has sufficient argumentative resources to refute it. For if Leibniz were to present an argument establishing that true unities must be like minds (by having representations of the world), such an argument would still not immediately exclude the possibility that they were physical points as well. Further, his arguments in favour of monads necessarily being associated with points of view in space would presumably restrict what he could say against them being identical with such points. As a result, Baumgarten’s position and argument are interestingly different from the positions that Leibniz and Wolff had explicitly taken into account.

Moreover, on the basis of these differences, Baumgarten’s position can provide more satisfying answers to two of the three questions that were posed above regarding Leibniz’s and Wolff’s views on the nature of monads or simple elements. First, since Baumgarten identifies monads with physical points, he is free to claim that the bodies that are composed by physical points are just as real, actual, and physical as physical points are. Therefore, he need not deny the reality of bodies because they depend on minds, as Leibniz was forced to. Nor does he need to be agnostic on the issue, as Wolff was, which represented an advantage only in so far as it allowed one to set the issue to one side. While it is true that Baumgarten cannot appeal to all of the details of Leibniz’s explanation of how the intrinsic unity of an entity having being *per se* could bestow accidental unity and hence being *per accidens*

on an entity that lacked it as such, since his argument for the necessity of monads depended on the nature of composition, he can appeal to the same explanation that was available to Wolff.

Second, Baumgarten would appear to have an obvious and considerable advantage over Leibniz and Wolff concerning the relationship between monads and bodies. The issue for Leibniz was that this relationship is problematic if the primitive forces of monads are exclusively *mental* and hence heterogeneous with the derivative forces of *physical* bodies. Because Baumgarten's monads are *physical* points, however, they are homogeneous with *physical* bodies, and there is therefore no principled objection to providing intelligible explanations of the connections between them. Before granting Baumgarten too much, however, one might pause to consider what it is that makes monads physical (and thus homogeneous with bodies) on his account. For Baumgarten describes a physical point rather unusually as 'an actual thing that is completely determined beyond its simplicity.' He is surely contrasting physical with mathematical points by emphasizing that physical points are (i) actual and (ii) completely determined, because mathematical points are not actual (since mere abstractions or fictions) and are determined only by geometrical properties (which, if Wolff is right, do not suffice to distinguish one point from another, a problem that would not arise if points are completely determined). However, this description could still leave one curious as to what is physical about such points and, specifically, what would distinguish them from metaphysical points (or monads as Leibniz understands them). Physical points are, for Baumgarten, impenetrable, but without knowing what intrinsic feature of monads makes them impenetrable, it could still seem unclear what constitutes the specifically physical dimension of physical points. But even lacking such an account, Baumgarten's view still allows for some measure of homogeneity between monads and bodies, which could suffice to resolve the question about the mind-body relationship that seems to arise for Leibniz and, to a lesser degree, Wolff.

If Baumgarten's view of monads as physical points helps to address the first two questions that arose for Leibniz's and Wolff's positions, his innovations, unfortunately, do not seem to be of any help in answering the third. Whether points are physical or not, they are

indivisible entities endowed with intrinsic properties of some sort, and as such, it is unclear how they can generate relational properties that would amount to more than purely logical relations. That is, without stating the nature of physical points in detail or how, specifically, they are completely determined, it seems difficult to say why they stand in any (non-logical or real) relations to each other.

While Baumgarten thus followed Leibniz and Wolff in accepting the necessity of simple substances, he developed an argument for this position that was original in so far as it focused exclusively on the ontological status of the parts of composite wholes. Moreover, he also proposed a novel understanding of the nature of simples by suggesting that they could be impenetrable physical points, an understanding that neither Leibniz nor Wolff explicitly considered and that helped to address two of the three questions that Leibniz and, to a lesser extent, Wolff had faced.

4. THE PRE-CRITICAL KANT

In 1756, some seventy years after Leibniz's first public criticism of Descartes's physics and just over sixty years after his sustained attack on Descartes's metaphysics, Immanuel Kant addressed several of these same issues in his *Metaphysicae cum geometria junctae usus in philosophia naturali, cuius specimen I. continet monadologiam physicam*, commonly referred to now simply as the *Physical Monadology*. Though Wolff and those sympathetic to his approach (such as Baumgarten) still dominated the philosophical landscape in Germany in the 1740s and early 1750s, his systematic position had come under serious and sustained attack in major publications by Christian August Crusius, a Pietist who advocated a strongly voluntaristic perspective, and in the writings and official activities of several highly influential members of the newly reformed Prussian Academy of Sciences in Berlin, such as Leonhard Euler and Pierre Maupertuis, who were both interested in the more scientific, and especially mathematical, dimension of natural philosophy. In light of these and other developments, it is not surprising that Kant did not simply accept Wolffian metaphysics without question during the first part of his career in the late 1740s and 1750s. Instead it makes sense in this context that he devoted his efforts to working out a position that would be able to reconcile a

fully intelligible metaphysics with principles that seemed fundamental to the pre-eminent science of his day.

The *Physical Monadology* represents a prime instance of Kant's efforts to integrate metaphysics and science in a comprehensive natural philosophy. For he explicitly introduces his task as that of explaining how 'metaphysics can be married to geometry, when it seems easier to mate griffins with horses than to unite transcendental philosophy with geometry'.⁵⁸ Moreover, what stands in the way of such a marriage is that 'the former peremptorily denies that space is infinitely divisible, while the latter, with its usual certainty, asserts that it is infinitely divisible'.⁵⁹ Kant proposes to remove this obstacle by showing that 'the existence of physical monads is in agreement with geometry'.⁶⁰ He begins his task by arguing for the necessity of monads in the Theorem of Proposition II as follows:

Bodies consist of parts, each one of which has an enduring existence. Since, however, the composition of such parts is nothing but a relation, and hence a determination which is in itself contingent, and which can be denied without abrogating the existence of the things having this relation, it is plain that all composition of a body can be abolished, though all of the parts which were formerly combined together nonetheless continue to exist. After having abolished, however, all composition among the parts that still exist, they have no composition at all, and thus are completely free from [any] plurality of substances, [and are] hence simple. All bodies, whatever, therefore, consist of absolutely simple primitive parts, that is to say, monads.⁶¹

Kant's argument for the necessity of simples is similar to both Wolff's and Baumgarten's, without being entirely identical to either one. Like Wolff's argument, Kant's argument depends on the contingency of composition, though it does not rely on the essence of a composite consisting exclusively in accidents, as Wolff's does, and it also contains steps absent in Wolff's. It is similar to Baumgarten's argument in so far as it focuses on the ontological status of what remains after all composition has been removed, but it is different in so far as it stresses that composition must be contingent, given that it is simply a relation between various parts. At the same time, there is nothing fundamentally new in Kant's line of argument.

⁵⁸ Kant, *Gesammelte Schriften*, i. 475.

⁵⁹ Ibid.

⁶⁰ Ibid. i. 477.

⁶¹ Ibid.

What is novel, however, is Kant's explanation of the relation between monads and space, and the way in which it allows him to reconcile the infinite divisibility of (bodies in) space with the simplicity of monads. Whereas Wolff had asserted that the intrinsic qualities of substances, when taken together, will give rise to a certain order, which was then identified—without argument—with space, Kant explicitly attributes this function to the activity of monads. Specifically, he introduces the notion of a 'sphere of activity' by means of which a monad can be present throughout an extended region of space, despite the fact that it is itself an unextended point in space.⁶² What Kant clearly has in mind here is impenetrability, since it is by means of a monad's sphere of activity that it 'hinders the things external to it and present to it on both sides from moving any closer to each other'.⁶³ Given that Baumgarten had already made impenetrability available as a fundamental property of monads, Kant is simply making explicit use of the metaphysical notion of activity underlying it to account for the emergence of space.

However, because Kant, unlike Baumgarten, distinguishes between the monad and the sphere of its activity, he can reconcile the infinite divisibility of space with the simplicity of monads quite elegantly. The basic move is as follows: Since a monad occupies space by means of its sphere of activity on other monads, the divisibility of space entails merely the divisibility of its relations to others, not that of its own substance, and is thus no threat to its unity. Kant explains how attributing a sphere of activity to monads can effect the desired reconciliation of the infinite divisibility of space with the simplicity of monads as follows:

But, you say, substance is to be found in this little space and is everywhere present within it; so, if one divides space, does not one divide substance? I answer: this space itself is the orbit of the external presence of its element. Accordingly, if one divides space, one divides the extensive quantity of its presence. But, in addition to external presence, that is to say, in addition to the relational determinations of substance, there are other, internal determinations. If the latter did not exist, the former would have no subject in which to inhere. But the internal determinations are not in space, precisely

⁶² See *ibid.* i. 480.

⁶³ *Ibid.*

because they are internal. Accordingly, they are not themselves divided by the division of the external determinations.⁶⁴

Kant's reconciliation of the infinite divisibility of space with the simplicity of monads thus depends on monads having both relational and intrinsic properties and on the latter being in some measure independent of the former (even if the former, asymmetrically, depend on the latter). For (i) divisibility entails a change in the relational properties of space, (ii) simplicity (or unity) is an intrinsic property of monads, and (iii) what is required for the reconciliation of divisibility and simplicity is that a certain kind of change in the former kind of property not entail a change in the latter kind of property. Kant's reconciliation thus asserts that these conditions are satisfied, because dividing (bodies in) space simply entails a change in a monad's relational properties, which can leave its intrinsic properties, such as its simplicity, unaffected, since changes in the latter need not bring about any changes in the former.

What may not be immediately evident, however, is that Kant's reconciliation presupposes a view that Leibniz, Wolff, and Baumgarten explicitly reject. For whereas Leibniz, Wolff, and Baumgarten, as we saw above, explicitly assert that the intrinsic properties of monads, when taken together, give rise to a certain order, which (relational property) is then identified with space, Kant's reconciliation assumes that monads can generate space by means of their causal activities on each other. That is, Kant thinks that spatial relations depend on causal relations between monads, which Leibniz, Wolff, and Baumgarten all reject by accepting pre-established harmony.

The debate about whether finite substances can act on each other or only themselves was hotly contested at the time and involved a wide range of philosophical topics, from narrow metaphysical and logical concerns to issues at home in natural theology—topics that require extensive discussion in their own right.⁶⁵ What is important in the current context is to see how Kant adds descriptive content to the causal relations between monads and thereby characterizes the nature of monads in more detail. As we saw above, Kant's initial

⁶⁴ Ibid. i. 481.

⁶⁵ See my *Kant and the Metaphysics of Causality* (New York: Cambridge University Press, 2005), ch. 1, for discussion of this debate.

characterization of the sphere of activity that each monad has involved impenetrability. But in the course of the *Physical Monadology* it becomes clear that he understands impenetrability not in terms of solidity, but rather in terms of repulsive force, and he argues that monads must have an attractive force as well if they are to have a determinate volume.⁶⁶ Further, Kant ascribes to monads a force of inertia, which he identifies with mass and which he uses, along with attractive and repulsive forces, to account for both the nature and specific differences of bodies.⁶⁷ In short, Kant draws heavily on Newtonian forces to fill out the account of monads that he has taken over in certain central respects from Leibniz and Wolff, since attractive, repulsive, and inertial forces all form fundamental principles of Newtonian physics.

The way in which Kant incorporates Newtonian forces into his metaphysical account of monads is important, because it reveals several interesting points of contrast with the views of Leibniz, Wolff, and Baumgarten. The first point concerns their respective views on whether monads can be said to be physical and, if so, in what sense. In so far as Leibniz considered the possibility at all, he denied that monads could be physical, since they were perceptual or mental, while Wolff was agnostic about the nature of simple substances. Baumgarten advocated the possibility that monads might be physical, but was not in a position to say in what sense they were physical beyond the minimal sense that they were impenetrable and fully determinate (and thus different from mathematical points). Kant, by contrast, is able to provide a much richer description of why monads are physical, because on his view, they are the immediate seat of several basic physical forces, that is, of forces that are directly causally responsible for the physical properties of bodies. That is, given his interests in reconciling metaphysics and physics, Kant does not merely explore the possibility, apparently overlooked by others, that monads could be physical in some minimal sense; instead he wants to base his account of the most fundamental properties of bodies *directly* on physical monads and their basic forces. Physical monads thus play a fundamental role in his natural philosophy at the time. As Kant remarks at the end of the Introduction to the *Physical Monadology*: ‘Anyone who is able to deduce these two principles [i.e. attractive and repulsive forces] from

⁶⁶ Kant, *Gesammelte Schriften*, i. 483.

⁶⁷ Ibid. i. 483–7.

the very nature and fundamental properties of the elements will have made a substantial contribution towards explaining the inner nature of bodies.’⁶⁸ His distinctive version of a physical monadology is of course supposed to do just that.

That Kant commits to physical monads in this way illustrates a second point of contrast, one that is perhaps even more fundamental than the first. By holding that what makes physical monads physical is their close relationship to physical forces, Kant applies in a very different way Leibniz’s distinction between primitive and derivative forces (which Wolff had taken over, at least in certain respects, without any apparent hesitation).⁶⁹ Because attractive, repulsive, and inertial forces can both explain the fundamental properties of bodies (which is what was of primary interest to Kant at that time) and be immediately grounded in monads possessing unity, there is no need to invoke any other, more fundamental forces of monads. In short, Kant’s proposal is to view physical forces, which Leibniz thinks of as instances of derivative forces, as fundamental and hence primitive.

Further, Kant is able to provide answers to the three questions raised above that differ significantly from those available to Leibniz, Wolff, and Baumgarten. First, because physical monads are not only physical, but physical in a robust sense—they are the seat of physical forces—the bodies that are generated through their activities (or forces) can be physical in a weighty sense as well. Accordingly, Kant can clearly avoid the paradoxical argument that Leibniz was saddled with, namely that the reality of bodies could be saved only by denying their reality in favour of their ideality. This result is especially important for Kant in so far as he explicitly rejects idealism at the time; in the *Nova dilucidatio*, the first consequence that he draws from the principle of succession is that a mind cannot cause a change in itself and thus must interact with external bodies if change is to be possible.⁷⁰

Second, Kant also has a clear rebuttal to the charge that monads are heterogeneous with bodies such that no intelligible relation between

⁶⁸ Ibid. i. 476.

⁶⁹ Baumgarten does not discuss the distinction between primitive and derivative forces in detail, perhaps because he thought that the distinction is central not to the most fundamental principles of metaphysics, but rather to the details of general or rational cosmology.

⁷⁰ Kant, *Gesammelte Schriften*, i. 411.

the two is possible. Kant's monads may or may not have representations and thus be endowed with mental powers, but at least those monads that compose bodies must have physical forces and there can therefore be no lack of intelligibility between these forces and the physical properties of the bodies that they cause.⁷¹ While Kant's response on this issue represents an obvious improvement over Leibniz and even Wolff, it is also stronger than Baumgarten's. For the only physical trait that Baumgarten could ascribe to monads was impenetrability. However, as we saw above, Baumgarten does not clarify what it is in a monad that makes it impenetrable to others. As a result, he may not have attributed enough physical content to his monads to avoid a charge of heterogeneity between them and the bodies to which they are supposed to give rise. Because Kant, by contrast, has provided a fuller account of the physical forces with which monads are endowed, he has no gap here at all, which allows him to answer this question quite straightforwardly.

Third, given the nature of his physical monadology, Kant can also address in a novel way the question of how the intrinsic features of monads can give rise to the relational properties of bodies. The basic idea behind Kant's response to this question is that the attractive and repulsive forces of physical monads are activities of the monads themselves, but monads can nonetheless have effects on other monads by means of these forces. In other words, physical monads have a nature (e.g. inertial mass) and causal powers (attractive and repulsive forces) that are intrinsic to them in the sense that physical monads have this nature and these causal powers regardless of what else exists in the world. At the same time, when these monads are placed in a

⁷¹ Instead, one might be concerned about vacuity. For it could appear to be meaningless to be told that a monad has an attractive force after seeing that it attracts other monads. It may well be true that it has an attractive force, but one knows nothing about the monad itself that one did not already know after seeing its effect. While Kant's response to this charge is more complex than can be treated adequately here, it is important to note two basic points. First, Kant's position is not simply that a physical monad has a force to bring about x (where x is some particular state), but rather that a physical monad has a force to bring about X (where X is a general kind of state, such as attraction). In other words, forces have generality built into them in such a way that inferring the existence of a force from a given effect is not completely vacuous. Second, it is an important part of scientific practice, according to Kant, that one attempt to reduce the forces that must be posited to account for all of the different effects that occur to as small a number as possible, a task that likewise shows that the inference from effect to force is not vacuous or trivial.

certain relation to other substances, they can, through the exercise of their causal powers in accordance with their nature and circumstances, have a certain 'sphere of activity' and thereby bring about changes in each other. By distinguishing in this way between the intrinsic activity of the cause and the relational character of the effect it brings about, one can understand how it is that activities intrinsic to monads can give rise to causal relations between substances.

One should not forget, however, what it is that allows Kant to provide such answers to questions that one might naturally raise for Leibnizian positions, namely a constellation of factors that were established in different ways by Leibniz, Wolff, and Baumgarten. Leibniz's philosophy provided many of the main elements of Kant's basic metaphysical framework (e.g. the concept of substance, the intuition that there must be simples, the idea that physics requires metaphysics, etc.). Wolff creates space for further Leibnizian possibilities by noting that not all simple substances have to be minds and drawing certain consequences from this point. Baumgarten makes use of this space by suggesting (but not developing in detail) the idea that simple substances might be impenetrable physical points, since neither Leibniz nor Wolff raises any explicit criticisms of such a point of view and it would have considerable advantages for explaining the properties of bodies. Kant seizes on this possibility and develops it in detail by combining it with Newtonian forces and his own distinctive views on causality so as to articulate an extensive and original natural philosophy. In this way, one can understand how a series of small changes in the thinking of post-Leibnizian thinkers made possible a shift of considerable magnitude from Leibniz's idealistic to the pre-Critical Kant's physical monadology.

5. CONCLUDING REFLECTIONS

If we are thus now in possession of a historically accurate and philosophically well motivated explanation of the transition from Leibniz's idealistic to the pre-Critical Kant's physical monadology, what fresh insights can be gained? Three points can, I think, be seen more clearly from this perspective. The first point, which is especially relevant to distinctively Leibnizian positions, focuses on the systematic importance of activity, the second point is particularly revealing in

regard to Leibniz's position, illustrating the centrality to his philosophy of the distinction between primitive and derivative forces, while the third point represents a very different view of the nature of Kant's Critical turn.

First, one can see quite clearly how fundamental the notion of activity is to any account that can be viewed as distinctively Leibnizian. For it is now clear that what is required as a link between the unity of simple substances and the plurality of (parts of) extended bodies is not necessarily a *mind* and its *representations*, but rather an *activity* that in some way *unifies* a multitude. As we saw above, Leibniz argued against Descartes that the infinite divisibility of space, and thus the plurality of the parts of matter that occupies any space, requires that true unities, or simples, exist. What was not immediately clear, however, was how a plurality of beings that, as such, lacked unity could be given reality by simples. How could a true unity bestow unity and hence being on another? Leibniz's ultimate answer was to note that *minds* are able to bestow unity and thus being on a multitude by *representing* them as related in a particular way (e.g. in virtue of similarities in their properties). Leibniz may have assumed that first-person introspection into one's own mind could reveal the structure of substances in general, and then inferred as a result that all simple substances are minds (or at least mindlike) and that in principle all substances could bestow unity on multitudes in the way that minds do.⁷²

What we have seen, however, by investigating the positions developed by Wolff, Baumgarten, and the pre-Critical Kant is that the crucial intermediary between unity and plurality need not be specifically mental, but can rather be the activity of a simple entity. For what is required is that something *act* so as to *take* a plurality of beings *together* such that relational properties emerge that can unify the various relata. The necessity of activity is implicit in Wolff, who repeatedly remarked that a plurality of simple beings must be 'taken together' for spatial extension to result, though his agnosticism about the nature of simples kept him from providing a detailed account of how exactly this is to occur. The point is illustrated more explicitly, however, by the position developed by the pre-Critical

⁷² See Donald Rutherford, 'Idealism Declined: Leibniz and Christian Wolff', in Lodge (ed.), *Leibniz and his Correspondents*, 214–37, esp. 230.

Kant, since his physical monads establish relations between each other by means of the exercise of their attractive and repulsive forces (i.e. their sphere of activity), which are clearly physical, not mental, activities.

Now one might counter that Leibniz had already publicly emphasized the importance of activity in 'On Nature Itself'. As he stressed there, it is the activity of finite substances that allows him to distinguish his position from that of the occasionalists and to articulate at least one fundamental criticism of their position. For according to Leibniz, finite substances must be the active cause of their own states at each and every moment such that activity serves as a criterion for identifying which states belong to a given substance. As a result, if finite substances were not active (as occasionalists maintain), then there would be, Leibniz thinks, no reason to prevent one from ascribing all states to God. Thus, Leibniz not only has a concept of activity available to him, but even gives it pride of place in his systematic metaphysics on grounds that are independent of the issues discussed above.⁷³

However, this rejoinder fails to acknowledge that activity plays an additional role that is fundamental to Leibnizian metaphysics. For the notion of activity is crucial for explaining not only how a plurality of *states* can be ascribed to a single substance (instead of to God), but also what binds a plurality of *substances* together into a larger unity.⁷⁴ Leibniz does make clear that (mental) activity is important for understanding how aggregates (e.g. organisms) are to be understood, but he does not seem to emphasize the systematic importance of such activities for comprehending the unity of the world as a whole. Leibniz suggests that monads must represent all other monads in the world, but he does not present a detailed argument for this point and does not suggest that one needs a principle to unify a plurality of independently existing entities such that they can belong

⁷³ Leibniz also conceives of activity as what is distinctive of substantiality, in contrast to the Cartesian conception of substance in terms of (relative) ontological independence.

⁷⁴ This line of thought naturally leads to a further question: How is it that activity is able to bestow unity on a plurality of beings? How is activity to be understood such that it can accomplish this task? By means of what features? My own hypothesis is that what distinguishes an activity from any more generic state of affairs is that activities are governed by rules, and it is the rules that are the source of the unity, though the causal component of activity is also required to bring the unity about.

to one and the same world. Though Kant similarly recognizes the importance of activity early in his career, he does not explicitly recognize the *systematic* importance of this kind of larger unity until his Inaugural Dissertation, when he makes causal activity (in the form of mutual interaction) into the principle of the form of the world.⁷⁶

A second point that is revealed by reflecting on how Leibniz's position on the necessity and nature of simples was received and modified by Wolff, Baumgarten, and the pre-Critical Kant concerns the distinction between primitive and derivative forces. Leibniz's reasoning on this issue started out with a comparatively modest point. To account for the reality of matter one cannot take matter to be extension alone, as Descartes had; rather, one must also accept the existence of something else that has the unity that extension lacks. This argument thus establishes a distinction between primitive and derivative entities in a very minimal sense, namely extension is derivative in the sense that it cannot exist on its own, but rather requires something else that is therefore prior to it. As Leibniz articulated further the nature of simples and the way in which they relate to extended bodies, he committed himself to a somewhat fuller account of the distinction. Thus, in the 'Specimen dynamicum' Leibniz characterizes the distinction in terms of forces, asserting that the simples have primitive forces, that derivative forces are limitations of primitive forces, and that derivative forces are directly responsible for the physical properties of bodies. In other contexts, Leibniz maintains further that derivative entities are nothing more than well-founded phenomena.⁷⁷ At the same time, Leibniz does not provide an especially detailed public description of the exact nature of the dependence of derivative on primitive forces. In particular, he seems not to address clearly enough two central questions: (1) Can primitive forces be described as the cause of derivative forces (and if so, in

⁷⁵ One might also think that Leibniz's 'world apart' doctrine stands in tension with the idea that representations as such unite monads into a single world.

⁷⁶ See §2 of *De mundi sensibilis atque intelligibilis forma et principiis*, repr. in Kant, *Gesammelte Schriften*, ii. 390–1.

⁷⁷ See Leibniz's reply to Foucher's objection published in the *Journal des Savants* (Apr. 1696), where he explicitly uses the term 'well-founded phenomena' in this sense (Leibniz, *Essays*, 147).

what sense)?⁷⁸ (2) Can the latter be understood on the basis of the former? Leibniz's main line of response for these questions is, it seems, that there is a pre-established harmony between these primitive and derivative forces that defies detailed explanation.

One can then view Wolff, Baumgarten, and the pre-Critical Kant as exploring more specific conceptions of the relationship between primitive and derivative forces and as developing their overall positions in accordance with the particular conceptions they have adopted. Thus Wolff accepted the idea that derivative forces are caused by, and should also be intelligible on the basis of, primitive forces; his doubts about whether Leibniz had proved the necessity of understanding simple substances as being mental were expressed in the context of his expectation that the forces of bodies *ought* to be derivable in an intelligible manner from the elements of corporeal things. However, Wolff also denied that we have an adequate grasp of the specific nature of primitive forces, which forced him to admit that we cannot understand in any specific way how derivative forces derive from primitive forces and, in fact, cannot even positively claim that the relationship between primitive and derivative forces is intelligible. At the same time, he could still reasonably hold that being ignorant of these matters is better than having to acknowledge that this relation is, in principle, heterogeneous, unintelligible, and therefore as standing in need of the special kind of connection that only pre-established harmony can provide.

Baumgarten, by contrast, saw a way in which to understand the nature of primitive forces such that one *can* positively establish the possibility of an intelligible explanation of derivative forces on the basis of primitive forces. By understanding points as physical rather than metaphysical and by characterizing physical points as fully determined entities (which suffices to distinguish them from mathematical points), he could accept a limited, but still genuine, sense in which the derivative forces of physical bodies can seem to be homogeneous with physical points, which establishes the possibility of an intelligible explanation of the one on the basis of the other. However, because of

⁷⁸ In the 'Specimen dynamicum', Leibniz does clearly state that the primitive forces are the grounds of the derivative forces, which are modes of the primitive forces, but the use of the terms 'grounds' and 'modes' does not, by itself, clarify the relevant issues sufficiently.

the purely formal way in which points are characterized, he cannot in fact provide any specific explanation.

The pre-Critical Kant then completed the trend that Wolff and Baumgarten had begun, by actually attempting to deliver a detailed explanation of the relation between physical monads and bodies that would allow it be fully intelligible. The main move here is to view attractive and repulsive forces as primitive rather than derivative, and the motivation for this step is as follows. Because the nature of attractive and repulsive forces is characterized in terms of their effects on bodies at a derivative level, one can give an intelligible explanation of how they cause particular physical states. Yet because the (intrinsic activities of the) forces themselves (as opposed to their effects) are viewed as primitive, the demands (for intrinsic unity and being *per se*) characteristic of Leibnizian metaphysics can still be satisfied. In this way, the pre-Critical Kant worked out a detailed understanding of the relation between primitive and derivative forces that has a greater degree of intelligibility than do those described by Leibniz, Wolff, and Baumgarten.

This description thus illustrates in a very concrete way not only how the distinction between primitive and derivative forces is central to Leibnizian philosophy, but also how different conceptions of it can give rise to a range of positions that differ from Leibniz's position, while still being recognizably Leibnizian (in a sufficiently broad sense). At the same time, it allows us to observe, from a somewhat more systematic point of view, the basic structure of these different positions and what motivations lead to them. What Leibniz, Wolff, Baumgarten, and the pre-Critical Kant agree on is that the primitive forces of monads are in some sense the causes of the derivative forces (and states) of bodies. The main disagreement concerns whether, and to what extent, this causal relation can be made intelligible. Since Leibniz holds that what happens at the level of the primitive forces of monads (according to teleological principles) and what happens at the level of derivative forces of bodies (according to mechanical, efficient principles) are related by pre-established harmony, and that neither level can be reduced to the other, he is committed to the claim that we can have no specific insights into any intelligible relation between the two. The pre-Critical Kant, by contrast, maintains that he can specify in detail an intelligible relation between the primitive forces

of (physical) monads and the derivative states of bodies and without losing anything essential to his metaphysics.

Had Leibniz lived to encounter such a position, he might have responded that the pre-Critical Kant overestimated what can be accomplished by failing to draw a crucial distinction between different kinds of causality. For Leibniz thought that primitive forces are merely *formal* causes of the derivative states of bodies and thus are able to explain only very general features of bodies, while derivative forces alone can serve as *efficient* causes of the particular states of bodies. On this view, Kant's account confuses different kinds of causation by having primitive forces function as (partial) efficient causes. However, from a pre-Critical Kantian perspective, Leibniz's response could seem merely to push the query back one step. For Leibniz has not argued against the possibility of what Kant is in effect suggesting, namely that one ought to be able to, and in fact can, understand how formal and efficient causality cooperate to bring about the specific states of bodies. Whether or not the details of Kant's particular way of developing this suggestion are ultimately feasible, it does raise an interesting issue for the fundamental possibilities inherent in Leibniz's (and Leibnizian) metaphysics.

These reflections on the transition from Leibniz's idealistic monadology to the pre-Critical Kant's physical monadology also shed light on a third point of interest by providing a new context for understanding Kant's position in the Critical period. For instead of being forced to accept at face value the Critical Kant's claim to have initiated a completely novel and allegedly revolutionary way of thinking, and to view his meta-philosophical arguments concerning the possibility of synthetic a priori knowledge as evidence counting in its favour, we can take into account the changes from the pre-Critical to the Critical period, and pose more specific questions about the exact nature and motivation for his Critical position.

Prior to considering Wolff's, Baumgarten's, and the pre-Critical Kant's positions, one might have thought that, on the issue of idealism, the Critical Kant was following Leibniz's lead and simply adding some twists and turns of his own (by, for example, developing innovative considerations concerning space and time and perhaps inflating his differences with Leibniz to mask their fundamental similarities). For Leibniz and Kant are both deeply committed to a

number of controversial metaphysical claims: spatio-temporal bodies are phenomenal or ideal, and not noumenal or real, a status that is reserved for radically different kinds of beings, namely agents that operate not in accordance with mechanical laws, but rather in accordance with their conception of the good. And, viewed from this particular perspective, Kant and Leibniz also seem to be motivated on this issue by the same philosophical considerations in so far as Kant's Thesis and Antithesis arguments in the Second Antinomy cover ground that we are already familiar with from Leibniz. The Thesis argument claims that there must be simples, a view that Leibniz argues for in the 'New System' and then gives pride of place to in *The Monadology*, while the Antithesis argument asserts that bodies must be infinitely divisible on the grounds that anything spatial must be divisible into further parts that are themselves spatial and thus divisible, a line of thought that Leibniz explicitly endorses in 'A New System of Nature'. Finally, since Transcendental Idealism's distinction between things in themselves and appearances allows one to relegate infinitely divisible bodies to the realm of mere appearances, while still holding out hope that noumenal substances are simple, the reasoning behind Kant's resolution to this antinomy can sound very similar to Leibniz's as well (even if it requires setting aside some differences merely terminological in nature). In short, if one considers the views of only Leibniz and the Critical Kant, the question one immediately faces is simply whether Kant's meta-philosophical reflections concerning the possibility of synthetic a priori cognition and his arguments (e.g. from geometry) for viewing space and time as merely subjective forms of intuition suffice to make the Critical philosophy as revolutionary as he claims.

After having investigated the views of Wolff, Baumgarten, and the pre-Critical Kant, however, we can see that a different question is actually more pressing. The question can be posed in one form as follows: Why did Kant ultimately turn to idealism when he had been familiar with such a position for several decades and had consistently rejected it (on grounds that had seemed adequate to him)? What this question reveals is that Kant's acceptance of idealism is to be viewed not as something that he inherited as an unquestioned (though not therefore unmodified) element of Leibniz's legacy, but rather as a fundamental reversal of position that requires positive

explanation against a particular historical background, and it is quite noticeable that such an explanation does not currently exist in so far as interpretations of Kant's familiar arguments for the ideality of space and time in the *Transcendental Aesthetic* do not immediately address more encompassing questions that would have arisen immediately and quite naturally in such a context, such as whether all of the properties of objects that appear in space and time must be ideal, just as space and time are.⁷⁹

The same question can be raised from another perspective as follows: What reason did Kant have for becoming dissatisfied with his pre-Critical physical monadology? It may be that the kind of argument typically advanced on Kant's behalf for Transcendental Idealism (e.g. his meta-philosophical reflections on geometry and the possibility of synthetic a priori knowledge) is relevant to understanding what he found objectionable about his early view, but it is striking, from our current vantage point, that standard discussions of Kant's 'Critical turn' have not explicitly addressed this particular issue at all. Further, it is worth noting that answering this question on the basis of the general arguments in favour of Transcendental Idealism that are most often discussed does not promise to be an especially easy or trivial task, given that the Critical Kant retains a number of the central claims of his earlier physical monadology. For example, Kant argues at length (in the *Metaphysical Foundations of Natural Science*) that attractive and repulsive forces are causes of the properties of bodies; he also holds that noumena, the ultimate level of reality, must be intelligible (since they are, by definition, beings of thought that we represent by means of reason), and also the cause of what appears to us at the level of bodies (even if we cannot cognize the specific ways in which such causation occurs); and Kant even repeatedly asserts that we must think (though we cannot know) that reality is ultimately composed of simple substances. At this level of detail, what changes in Kant's view is instead that attractive and repulsive forces are, to speak with Leibniz, no longer primitive, but rather derivative; to put the point in Kant's own terminology, the substances that are endowed with attractive and repulsive forces are not noumenal, but rather phenomenal and thus not

⁷⁹ For a preliminary discussion of this issue, see my 'Transcendental Idealism and the Categories', *History of Philosophy Quarterly*, 19 (2002), 191–215.

simple. Since perhaps the central difference between the pre-Critical and the Critical Kant that is relevant to this issue—whether particular forces should be ascribed to phenomenal or noumenal substances—is not a topic that is the immediate focus of more standard discussions of Transcendental Idealism, considerable conceptual manoeuvring will be required to forge the requisite link, if such a link is even possible at this level of generality.

These remarks about Transcendental Idealism, as well as the other two points just mentioned, are, of course, extremely sketchy and preliminary in nature, and would need to be treated in much greater detail for us to be able to draw definitive conclusions from them. Still, they do reveal how focusing on the specific arguments and positions of Wolff, Baumgarten, and the pre-Critical Kant concerning the necessity and nature of simples can not only render intelligible how the transition from an idealistic to a physical monadology could have occurred quite naturally in certain historical circumstances, but also provide us with a novel perspective from which we can discern important aspects of Leibniz's and Kant's own philosophies with greater clarity.⁸⁰

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