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# Beyond Bounds: Infinity in Cavendish's Ontology

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Margaret Cavendish endorses the view that matter is actually infinite. This paper offers a systematic treatment of Cavendish's views on infinity as developed in her later philosophical works (roughly, from *Philosophical Letters* onwards). The paper explains what it is for Cavendishian matter to be infinite and why the infinity of matter is, as Cavendish claims, a principle of her natural philosophy: on my reading, the infinity of matter is a partial ground for the multiplicity and finitude of material effects, as well as for the spatial and temporal boundlessness of the material world. The paper also establishes that being infinite is not a contingent feature of Cavendish's matter, but a necessary one.

## 1. Introduction

Some early modern philosophers shy away from attributing actual infinity to the natural world. Descartes claims that the world is indefinitely extended, but is not, and could not be, infinite: God alone is infinite. Thomas White and Kenelm Digby take the actual world to be finite. Atomists make the world finite at the lowest scale, with some, such as Pierre Gassendi, also restricting the variety of atoms. Thomas Hobbes regards the question of the infinity or finitude of the

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world as ultimately unanswerable. By contrast, Margaret Cavendish holds that the natural, material world is, and must be, actually infinite.

The infinity of matter is central to Cavendish's philosophy. At times, she even claims that the Infinite self-moving Matter[1] is the ground of her natural philosophy (e.g., PL: 5).[2] On her account, if something is a ground of natural philosophy, then explanations of natural phenomena bottom out in it: the fundamental features[3] of matter are the ultimate grounds, or causes,[4] of all change and variety in nature (see, e.g., OEP: 236). Qua cause, matter consists in the rational, sensitive, and inanimate degrees. These 'constitutive parts' are distinguished from the 'effective parts', or 'creatures'—the parts of matter that are precisely its *effects* (e.g., OEP: 31). Due to this specific constitution, and the essential nature of matter as having parts, the parts of matter are self-moving, self-knowing, and perceptive. In addition to its constitution and parthood structure, Matter is, for Cavendish, defined by its infinity.

The goal of this paper is to flesh out Cavendish's views on the infinity of Matter. My argument proceeds as follows: first, in Section 2, I establish on textual grounds that, for Cavendish, to be infinite is to be unbounded—that is, not to be limited. I also defend the claim that, for her, this is the most fundamental account of infinity we can provide. In Section 3, I show that it would be a mistake to treat the infinity of Matter as equivalent to either plenism or eternalism about the natural world: the infinity of Matter grounds, and is thus distinct from, the infinite extension, duration, and variety of the world. Equivalently, we cannot simply paraphrase or reduce material infinity to, e.g., unlimited extension in space and time. I defend the view by responding to Cunning (2016) and Boyle (2018). Accordingly, the aim of this section is to strengthen the view that the infinite matter serves as foundation for all other

1. Following Cavendish, I use 'Matter', 'Infinite Body', and 'Infinite Matter' interchangeably.
2. I use the following abbreviations for Cavendish's works:

   PPO: *Philosophical and Physical Opinions* (second edition 1663)
   PL: *Philosophical Letters* (1664)
   OEP: *Observations upon Experimental Philosophy* (1666; second edition 1668). All citations are to the O'Neill 2001 edition (based upon the 1668 edition)
   GNP: *Grounds of Natural Philosophy* (1668). All citations are to the 1996 edition

3. I use 'feature' to remain noncommittal about Cavendish's metaphysical toolkit. If properties are dependent beings, then Cavendish rejects them (e.g., Peterman forthcoming). If properties are modes—specifically, qua 'ways' (e.g., Heil 2014) —the issue is less clear. Peterman argues that Cavendish rejects modes, but I am not entirely sure we can entirely discard 'ways'. I also leave open the possibility that, for Cavendish, the 'features' of matter are attributes, perhaps in a sense akin to the essential features of matter. My caution here applies only to the ontological status of matter's features. For 'creatures' (i.e., the effective parts of matter), the situation differs, as their features derive from the infinite body of matter as their cause.

4. I use 'cause' and 'ground' interchangeably to denote what determines the being and identity of an effect, consistent with Cavendish's usage.

material infinities that Cavendish defends. Section 4 defends what I call the containment-by-respect interpretation of her claim that Infinite Matter contains other infinities. In turn, given this model and the Cavendishian infinite, Section 5 explains how Cavendish derives the necessary finitude of effective parts from the infinity of matter. These claims clarify Cavendish's assertion that the Infinite self-moving Matter is the ground of her philosophy. In the final section, I offer a Cavendishian *reductio ad absurdum* meant to establish that matter must be necessarily infinite. If the claims I defend here hold, they would not only constitute the first systematic treatment of Cavendishian infinity as a metaphysical ground in her philosophy, but would also show that, despite her materialistic monism about the natural world, Cavendish can coherently uphold a plurality of material beings.

## 2. Cavendish on the Infinity of Matter

Although Cavendish revised certain aspects of her theory of matter, she never wavered in her commitment to Matter's being infinite (e.g., PL: 5; OEP: 239).[5] Since this commitment in itself neither constitutes nor guarantees a consistent and stable conception of infinity, this paper focuses on Cavendish's mature philosophical works, roughly from *Philosophical Letters* onward.

For Cavendish, Matter is infinite, God is infinite, Matter's actions are infinite (e.g., PL: 520), Matter has infinitely many parts (e.g. PL: 6), there are infinite degrees of motion (e.g., PPO: 7; OEP: 32–3), each quality has infinite degrees (e.g., OEP: 197), and the world is infinite in duration and space (e.g., PL: 6). She holds that there are infinitely many worlds in Infinite Matter, and states that there are 'infinite several manners and ways of perception' (GNP: 9), which will ultimately be grounded in the infinite varieties of motion (e.g., GNP: 13, 180). Infinity is ubiquitous in Cavendish's philosophy.

What makes something infinite? Cavendish's answer is not especially surprising: the absence of limits. She describes the infinite as 'in no ways bound and confined' (PL: 155); beyond 'all bounds and limits of measure' (PL: 6); and with 'nothing exterior with respect to infinite' (OEP: 130, 131, 199; GNP: 11, 88). Like Hobbes (1994:15), Cavendish holds that we cannot know the infinite 'positively' (non-inferentially). Instead, she infers from the finite that the infinite is

5. It is no surprise that Cavendish uses the term 'infinite' so often. According to Mendelson, '[t]he database *Women Writers Online* lists 592 occurrences for the words "infinite" or "infinity" in *Philosophical Letters* (London, 1664), and 552 occurrences in *Observations upon Experimental Philosophy* (London, 1666), as well as scattered occurrences throughout the rest of Cavendish's oeuvre' (Mendelson 2022: 72).

unbound, because she treats finite and infinite as logical opposites.[6] Since having limits entails finitude, by contrapositive being infinite entails having no limits—being unbounded.

In this section, I show that infinity as unboundedness is fundamental and irreducible for Cavendish, by considering alternative interpretations and explaining why they do not succeed.

To start, suppose we interpret the 'infinity as unboundedness' claim epistemically: for any $x$, $x$ is infinite iff we know of no limits to $x$. The epistemic option can be quickly ruled out: it puts the epistemological cart before the metaphysical horse. Material infinity is a metaphysical fact for Cavendish. As such, it is not affected by facts about whether and how we come to know what it is 'like' to not have limits (e.g., OEP: 130–1).

An alternative option is to reinterpret Cavendishian infinity as Cartesian indefinite. Prima facie, the solution is well motivated, since the absence of limits is the defining feature of the Cartesian indefinite. But the Cartesian conception cannot be extended to Cavendish. Schechtman (2018: 38) provides a systematic treatment of the Cartesian indefinite as iterative unlimitedness. For a thing to be iteratively unlimited, it must jointly satisfy two conditions: (a) for any arbitrary part of the thing, there exists another part that is greater; and (b) there is no upper limit (no greatest part). The two conditions appear to have textual support:

> [I]f there cannot be extremes in infinite, there can also be none in nature, and consequently there can neither be smallest nor biggest, strongest nor weakest, hardest nor softest, swiftest nor slowest, etc. in nature. (OEP: 199) This aligns with condition (b).
>
> [F]or so there may be infinite degrees of magnitude, as bigger and bigger; but these degrees are nothing else but the effects of self-moving matter, made by a composition of parts … they belong to the infinite parts of nature joined in one body. (OEP: 30) This aligns with condition (a).

Thus, for any arbitrary 'degree of magnitude', there will always be another that is bigger, and there couldn't be anything that satisfies the *greatest* magnitude. But a closer consideration of the textual evidence reveals an important difference. What sorts of things satisfy these two conditions? Cavendish is explicit: the effects of the self-moving matter and the various compositions of parts. Thus, what Cavendish is saying is that, for any collection of composed parts (i.e., for any effective part), there exists another larger collection. So, condition (a) is

6. This situation brings about an epistemic hurdle: since we must infer the infinite from the finite, we risk mistakenly attributing to the infinite features that belong only to particulars (e.g., OEP: 130).

satisfied by the effective parts. And, similarly, the no-upper-limit claim applies equally to the compositions of parts.

However, from the fact that the effective parts satisfy conditions (a) and (b), it does not follow that Cavendish's self-moving Matter itself also satisfies them. For Descartes, matter is identical to extension, so an explanation of what it is for extension to be indefinite also explains what it is for matter to be indefinite. However, since Cavendishian Matter cannot be reduced to extension, the indefiniteness of extension alone does not suffice to establish what it is for Matter to be infinite. Moreover, for Matter to satisfy condition (a), it should be possible to truly predicate of Matter that it is 'smaller than' or 'greater than'. This, in turn, would require that there is something to which Matter can relate so that it can be compared. Cavendish, however, explicitly rejects both claims (e.g., OEP: 47). And, as a final point, in the OEP: 30 passage, Cavendish makes use of the infinity of Matter to explain why condition (b) holds. Based on that, condition (b) cannot be a constitutive feature of the infinite, but rather an implication of it. For these reasons, I think we are warranted to conclude that Cavendishian infinity is not equivalent to Cartesian indefiniteness.

Consider now a third option, which I call the *totality view*.[7] On this view, matter is infinite in that it encompasses all possible material things. In other words, the view takes the infinite as something analogous to the universal quantifier *all*. The totality view encounters the following problems: first, it directly conflicts with Cavendish's reiterated claim that 'there is no such thing as All in Infinite' (PL: 5). Second, if matter were a totality in the sense of a universal quantifier, it would necessarily have definite boundaries in the sense of its being a *totality of Xs*.[8] Third, if Matter just denotes the totality of its (effective) parts (creatures and their actions), we can now ask what justifies treating Infinite self-moving Matter as the cause of these parts. If 'Infinite Matter' and 'all of matter's parts' are treated as identical—that is, as two terms referring to the same thing—it becomes difficult to see how Infinite Matter can be the cause of all of the parts. Fourth, if each part of matter is finite, what grounds the conclusion that the set of all finite creatures should be unbounded (e.g., OEP: 101)? Finally, Cavendish

7. Interpretations akin to the totality reading are the default readings of Cavendishian infinity. See, for instance, Boyle (2018) and Cunning (2016).

8. The interpretation suggested here parallels that defended by Bennett (1984: 17–8) for Spinoza's attributes. On Bennett's reading, when Spinoza talks about the infinity of attributes, he means all logically possible attributes. In the main text, I conclude that treating the infinite as a totality of something does entail putting limits on the infinity of matter. Obviously, this is not Bennett's view about Spinoza's attributes. Moreover, there is a further substantial difference: each of Spinoza's attributes fully expresses the essence of the substance, so it cannot constitute a limit on the substance. But this is not the case for Cavendish's parts of matter. On the contrary, the finitude of each part of matter entails its limitation. I would like to thank an anonymous referee for pushing me on this point.

allows for 'infinities within infinites' (e.g., PL: 5). This suggests that we should distinguish between having i*nfinitely many parts* and having a*ll the possible parts*: given the 'infinities within infinities' claim, we cannot suppose that their extensions are identical.[9]

In the vicinity of the totality view lies a distinct, although related, view, which I call the *completeness view*. It holds that for matter to be infinite is for it to be complete—it neither requires a 'co-partner' for subsistence nor allows for new 'ontological' additions or annihilations (e.g., OEP: 47). Infinite self-moving Matter is entire in itself (e.g., OEP: 216). I see two problems with this view. First, if we treat the properties 'being infinite' and 'being complete' as identical, it becomes unclear how the other features of matter could be qualified as infinite since neither is *per se* complete. Second, and more importantly, facts about matter's being complete are explained by the very nature of matter as infinite. For instance:

> As there can be no annihilation, so there can neither be a new creation of the least part or particle of nature, or else nature would not be infinite. (OEP: 137)
>
> As for nature, she being eternal and infinite, is not subject to new generations and annihilations in her particulars. (OEP: 254)

Thus, it is the infinity of matter that explains its completeness, and not the other way around. For if matter were finite or indefinite, it would be possible for God to add or remove existents, which would undermine matter's intrinsic completeness. In Descartes' world, God *can* do this but *won't* do it because he is good. In Cavendish's world, if God were to add or remove material existents, he would destroy matter itself.

In summary, we can characterise that which is infinite as that which is unbounded from its opposite, the finite. However, beyond this, no further reductive account can be given: the infinite is fundamental. But why hold that Matter is infinite? Although more reasons will be given throughout this paper, here is one way to answer the question: if Matter, as the cause of everything, were not infinite, then some of its effects would be groundless. Cavendishian Matter has parts essentially, and because it is constitutively self-moving, it composes and divides them. These features explain the variety of effects and their properties. However, they alone cannot explain the maximum variety of effects, the plenism, the unending temporal duration, and, as McNulty (2018) argues, the fact that nature is 'balanced' in its actions. If these facts were groundless (and yet

9. This distinction is well represented in Anne Conway's philosophy (e.g. *Principles* III.5: 17). There, it becomes clear that the domain of 'all' is broader than that of the 'infinite'. Each creature can have infinitely many parts, while creation encompasses all possible creatures. In contrast, Cavendish downplays this distinction, as her notion of 'infinity within infinity' is not mathematical.

admitted as facts), then ontologically they would be emergent. Cavendish, however, is no ontological emergentist; she argues that new creations cannot occur: 'there can neither be a new creation of the least part or particle of nature' (OEP: 137). Thus, material infinity qua cause at least partially grounds other facts about Matter insofar as it has effects.

## 3. Some Cautionary Tales

In the previous section, I established that, for Cavendish, to be infinite is to be unbounded and that no alternative analysis of the concept is more satisfactory. I also suggested that infinity grounds (at least partially) some the features that Cavendish attributes to Matter. In this section, I corroborate this claim by showing that the alternative solution, that of reducing facts about material infinity to facts about plenism and the eternity of matter, cannot work. If my reading is correct and the infinity of matter is basic, then infinity serves as a (partial) metaphysical ground for the spatial and temporal extension of matter. And, if the infinity of Matter grounds these facts, then it cannot be identical or reducible to the facts it grounds. Thus, Matter is everywhere (plenism), and exists at all times (eternalism), *because* Matter is infinite, and not the other way around.

### *3.1. Cavendishian plenism*

For Cunning, Cavendish's claim that matter is infinite because nothing limits it is equivalent to the claim that matter is a plenum:

> For Cavendish, the universe is infinite in the sense that it is unlimited, but it is unlimited in the sense that there is nothing that bounds or limits it. There is no empty space into which matter might expand, and the plenum can never produce any new matter (or space) in addition to the matter and space that already exist. (Cunning 2016: 172)

On this reading, Cavendishian Matter becomes Cartesian. Descartes argues that spatial extension and body are identical, so the indefiniteness of matter is simply its three-dimensional indefiniteness. But Cavendish is not Descartes. Why regard three-dimensionality as an essential feature of matter, rather than merely necessary or accidental? Or, in Cavendishian terms: why not treat dimensionality as an effect rather than as a basic feature of matter? Cavendish rarely (if ever) ascribes spatial features to matter qua cause and does not treat extension as a foundational principle of natural philosophy. She, however, does sometimes

explicitly treat spatial properties as effects of self-moving matter (e.g., OEP: 124, 130, 193). Could she be reversing the expected explanatory order—not 'matter is infinite *because* it is everywhere', but rather 'matter is everywhere *because* it is infinite'? Moreover, Cavendish treats 'Infinity in Magnitude'—which is 'infinite in Quantity, Bulk, that is such a big and great Corporeal Substance'—as just one 'kind' of infinity (e.g., PL: 6; PPO, preface). In this case, 'having magnitude' might properly pertain to matter, but would not be identical to it.[10] Thus, matter's infinity grounds its being a plenum but is not identical to it.

Cavendish distinguishes between infinity and spatial extension when she defends the possibility of multiple infinities against the intuitive objection that one infinite entity would exhaust 'all place imaginable'. She writes:

> [S]ome Scholars will say, there cannot be Several Infinites, because one Infinite would Possess all Place imaginable, and so one Part would not Leave room for the next; but it may be answered, that Infinite matter carries Place with it. (PPO 1663: xxviii)

Prima facie, the defence that 'infinite matter carries its place with it' fails.[11] If infinite matter carries its own place with it *and* there are no further places, then there is nowhere for matter to go. The very idea of 'carrying its place' becomes nonsensical. If, on the other hand, the infinite matter does carry its place to a new place, then the new places would have to be immaterial. Cavendish would reject this because she endorses causal closure of substances—material and immaterial entities cannot interact, and they would have to be interacting if matter were to occupy these new 'places'. Moreover, this interpretation would be question-begging since now we flatly deny that the infinite matter occupies 'all place imaginable'.

So, I propose an alternative reading. In her response that 'infinite matter carries its place with it', Cavendish implicitly points to an internal inconsistency in the objection: it treats the infinite thing and 'all the place imaginable' as both

10. Cavendish attributes quantity to matter: 'whatsoever has body, or is material, has quantity; and what has quantity, is divisible' (OEP: 137). However, for Cavendish, possibly following Digby here, to have quantity is to have parts. Digby observes that quantity has several species: magnitude, place, motion, time, number and weight (Digby 1644: 15). Thus, while it is true that what is truly predicated of magnitude can be truly predicated of quantity, the reverse is false: it is not true that whatever is truly predicated of quantity will also be true of magnitude. If Cavendish follows Digby and takes magnitude to be a species of quantity, then further argument is required to establish that Cavendishian material parts are, necessarily, three (or four) dimensional. For further considerations about quantity in Cavendish, see Peterman (2025: 38, 86) and Whiting (2024).

11. In this paper, I remain agnostic between three views on matter's relationship to place: (a) matter *is* place, (b) matter has place as a property, and (c) matter has place as effect. I incline toward the third view but will not argue for it here.

distinct and identical. For the objection to get off the ground, we must suppose two distinct things—infinite matter and the entity 'all place imaginable'—related by containment. But, for the objection to succeed, matter and 'all place imaginable' must be identical; if they are distinct, there is no necessary requirement for an infinite thing to occupy any place. If everything infinite necessarily had to be spatially located, then the objection to a multiplicity of infinities would be question-begging. The possibility of multiple infinities, Cavendish suggests, is not tied to the question of spatial extension. The objection that multiple infinities are impossible because they would occupy all space misses the point.

In summary, infinity is not inherently tied to spatial features. The proper order of explanation moves from the fact of the infinity of matter to its being present spatially everywhere.

### *3.2 Matter is not in time*

*Pace* Cunning (2016) and Boyle (2018), Cavendishian infinity should not be equated with eternity. According to Boyle, 'to say that matter is eternal means … that matter is "Infinite in time and duration"'.[12] The interpretation is appealing for at least two reasons. First, it is conceptually conservative[13]—if correct, Cavendish introduces no conceptual innovation here. Second, it has explicit textual support, since Cavendish claims that there is 'Infinite in Time or Duration, which is Eternity, for Infinite and Eternal are inseparable' (PL: 8).

Yet despite its apparent textual support, treating eternity as infinity in time conflicts with other claims Cavendish makes: (a) time and eternity are distinct, although inseparable (PPO 1663: xxviii, 7, 60; PL: 304); (b) motion and time are (for lack of a better word) species of eternity (e.g., GNP's short chapter 'Of Time and Eternity'); and (c) eternity is that which lacks beginning and end—'For Eternity consists herein, that it has neither beginning nor end' (PL: 17; see also PL: xxxii; PPO: 20; OEP: 268).

Moreover, Cavendish explicitly treats that which has no beginning and no end as non-temporal:

> [A]ll beginning supposes time; but in God is no time, and therefore neither beginning nor ending, neither in himself, nor in his actions; for if

12. Boyle holds—and with this claim I do agree—that 'an eternal universe is necessary because it is required for change to occur' (Boyle 2018: 115).

13. In a hypercontextualist climate, conceptual conservatism will often operate as a tacit assumption for historians: it allows them to infer intellectual continuities across authors. But, to paraphrase Wilson's (2006) notion of tropospheric complacency, the premise can be dangerous because it can make us blind to conceptual innovation.

> God be from all eternity, his actions are so too, the chief of which is the production or creation of nature. (OEP: 220)

That which is in time has beginning. Neither God nor Nature are *in* time, and yet both are eternal.

We also have further reasons to resist the identification of eternity with infinity in time. First, while matter (and God) are entities which are properly eternal, time, strictly speaking, is not. Cavendish is clear on this point:

> [T]here can be no such thing as Time in Nature, but what Man calls Time, is only the variation of natural motions; wherefore Time, and the alteration of motion, is one and the same thing under two different names. (PL: 303)

To be infinite with respect to time, then, is to be not limited with respect to the successive variations (changes) of corporeal motions. Secondly, if time lacks being, then, strictly speaking, time itself cannot be infinite: non-beings do not take predicates. Thus, eternity is a non-temporal feature, whereas infinite duration is temporal.

But why, then, does Cavendish seemingly equate eternity with 'infinite time or duration' (PL:8)? I would say that she does not. Cavendish is not claiming that infinite time *is* eternity, but rather that the eternity of matter grounds the existence of an infinite succession of variations of motion, infinite succession which we can call 'infinite in time, or duration'. This interpretation explains why Cavendish often asserts that matter is 'infinite and eternal' (PL: 14, 462) and claims that time and eternity are 'inseparable'.

### *3.3. The infinity of matter is not a quantity*

Is Cavendishian infinity a quantity? Cunning thinks so:

> [Cavendish] is very clear that the universe is infinite in the sense that there exists nothing to bound or limit it. Indeed, there is a sense in which the universe for Cavendish is actually finite, although she would not prefer that language herself. There is a *constant amount of matter* that composes the plenum; there is no expansion of the plenum into empty space, and matter can never produce more of itself than the plenum already (and for all eternity) contains. (Cunning 2016: 148; italics mine)

Cunning turns Cavendish into a quasi-Cartesian by claiming that there is an actual quantity of created matter, which he argues limits matter's ability to

expand or 'produce more of itself'. I do not find sufficient reason to endorse either claim. While matter cannot expand in space, this is because, according to Cavendish's ontology, there is no such thing as space (in this sense) for it to expand into. Matter cannot produce more of itself because matter is infinite, and infinity is not a countable or measurable quantity: Cavendish claims that infinity does not admit of 'more or less' (OEP: 177) and that the 'infinite is neither to be Number'd nor Measure'd, neither to be Added nor Diminished' (PPO: xxviii).

But aren't these claims in tension with the view that matter is infinite in *bulk* (e.g., PL: 5)? Cavendish describes Matter as 'a big and great Corporeal substance, which *exceeds* all bounds and limits of measure, and may be called Infinite in Magnitude' (PL: 2; italics mine). What Cavendish is saying here, *pace* Shaheen (2019: 3553, 3567), is not that Matter is maximally large, but that what makes the corporeal substance infinite is precisely 'exceeding' measure: it is *beyond* measure.

The infinite is not measurable: 'measure … is only an effect of a finite magnitude, and belongs to finite parts: that have certain distances from each other' (OEP: 131). The qualification at the end is instructive: 'distance', Cavendish explains, 'properly doth not belong to infinite, but only to finite parts; for distance is a certain measure between parts and parts' (OEP: 130). Measure requires a relationship *between* parts. If measure is modelled on distance, and distances are between *here* and *there*, then there is no measure with respect to the Infinite Matter just because there is no *there*—and consequently, no *between*. Moreover, unlike finite parts, Infinite Matter cannot relate to anything because there is nothing outside it. It 'has no sharer or co-partner, but is entire and whole in itself' (OEP: 47). Thus, Infinite Matter cannot be measured: no unit of measure can be defined for it, because it cannot be related to anything outside itself: 'there's nothing exterior in respect to infinite' (OEP: 130).

But could we not move from the finite distances between parts to infinite distance through addition? It might seem that, based on Cavendish's own criteria for measurability, the infinite number of parts in Nature should be a measurable infinity. If we can count (or measure) the members of a finite set, it might seem that we could extend the notion of countability to an infinite collection. For instance, if there can be a finite distance between two parts, then there can be an infinite distance, since 'if there be an infinite line which has no ends, one might call the infinite extension of that line "an infinite distance"' (OEP: 131). Cavendish's response to this worry is that 'infinite distance'

> is an improper expression; and it is better to keep the term of 'an infinite extension', than call it 'an infinite distance'; for, as I said before, distance is measure, and properly belongs to parts. (OEP: 131)

The problem is that, with distance and measure defined as being between one thing and another, there is no determinate one thing or the other to be found in an infinite number: if a line stretches from point A to point B, from and to where does an *infinite* line stretch? In terms of counting, the issue is not merely the absence of an upper bound for the infinite number; rather, as soon as we begin to count, we have already established a *lower* bound. When you select any arbitrary starting point, you set a limit and thus make the series only *potentially* infinite at best, but not *actually* infinite since it now has an 'extreme'. Put succinctly, 'who can number from finite to infinite?' (OEP: 102).

Thus, the Cavendishian infinite resists counting and measures, not because it is too large, but because it is not the kind of thing that can be measured at all: enumeration, grouping, and measuring presuppose finitude. But it is impossible to move from finitude to proper infinity, so none of these activities can be a guide to infinity itself (e.g., OEP: 102). The infinite is non-numerical and non-quantitative. To put it in contemporary terms, it is a category mistake to attribute quantitative predicates to infinite matter itself.

The infinity of matter is not a quantity to be subjected to measures, comparisons, counting, and so on. Similarly, infinite matter is not created in time or space because space and time have no being. Saying that matter is 'everywhere' is not erroneous, but the claim is (at least, partly) explained by matter's being infinite with respect to substance. The infinity of matter grounds its infinite spatial extension, and not its extension its infinity. Additionally, it is true that matter is infinite temporally, but this is so because matter is infinite with respect to lacking beginning and end (its eternity), and to its unlimited changes in motion (which is its infinity in duration). The infinity and eternity of matter thus explain its infinite duration, rather than the inverse.

### *3.4. On multiple natural infinities and their relationship*

We have seen that Cavendish treats infinity as unboundedness and that, while matter lacks spatial and temporal limits, this is *because* it is infinite—it is not *what it means* for matter to be infinite. At the same time, Cavendish characterises a variety of things as properly infinite. But how can that be? How can we treat the infinite as unbounded while allowing *multiple* things to be infinite, and thus unbounded? After all, if infinity is unboundedness (i.e., the absence of limits), one might expect that anything infinite must be unique—since if two things were infinite, they would impose limits on each other and cease to be infinite. However, this conclusion applies only to two things of the same kind. If 'being infinite' means 'being unbounded', then two things of the same kind cannot both be infinite. Yet this does not rule out the possibility that different kinds of thing

can each be infinite in their own way. This is precisely how Cavendish thinks about the relationship between the infinities of God and Nature:

> [T]he disparity between the Natural and Divine Infinite is such, as they cannot join, mix, and work together. (PL: 10)

God is divinely infinite, and Nature is naturally infinite. Nature and God are not co-equal because each is infinite in its own kind.

But, this solution cannot explain why all sorts of things pertaining to matter are truly describable as infinite. Since these things are of the same kind (for they are all essentially matter), they would bound each other and no longer be infinite. The puzzle, then, is how it can be true that materially infinite things are both unbounded and multiple. Cavendish's solution has two parts. First, Cavendish distinguishes between various 'kinds of infinities':

> But as for Infinities, you must know, *Madam*, that there are several kindes of infinities. For there is first Infinite in quantity or bulk, that is such a big and great Corporeal substance, which exceeds all bounds and limits of measure, and may be called Infinite in Magnitude. Next there is Infinite in Number, which exceeds all numeration and account, and may be termed Infinite in Multitude; Again there is Infinite in Quality … also Infinite degrees of Motion, and so Infinite Creations, Infinite Compositions, Dissolutions, Contractions, Dilations …. Besides there is Infinite in Time. (PL: 5–6)

Second, Cavendish goes on to claim that these infinities are contained in one another:

> Moreover, when I say, That one Infinite is contained within another; *I mean, the several sorts of Infinities … which are contained in the Infinite body of Nature*. (PL: 530; italics mine)

Let's begin with the second point and make sense of what precisely it is for infinity to contain infinities. The claim is especially puzzling since that which is infinite is unbounded, while things contained by other things are bounded.

A first interpretation is what I call the *nested model*.[14] Thus:

> [S]ome Scholars will say, that one Infinite cannot be in another Infinite; it may be answer'd, as well as one Creature Lieth in another. (PPO: xxix)

14. For instance, Mendelsen's (2022: 75) interpretation of Cavendishian infinity follows the nested model.

According to this model, infinite matter contains infinite magnitude, which in turn contains infinite number, which contains infinite action, which contains infinite compositions, and so on—just as some finite entities are nested within other finite entities, like parts within parts in living organisms. In this model, infinite matter contains infinite magnitude in the same way that my body contains my gut bacteria. But there is something puzzling about the solution. Consider the case of the infinity of matter in space and in time—which contains which? Given the nested model, one would have to contain the other, but we have no reason to conclude that the infinity in bulk (or equivalently, in space) contains the infinity in time, or vice versa.

Moreover, the nested model relies on a difference in size: the containing part must be larger than the parts it contains, such that the deeper one goes into the nested structure, the smaller the parts become—a body being larger than its organs, and a heart being larger than its ventricles. But not all Cavendishian infinities are size based. Cavendish allows for infinities of quality, and without further argument, we should not assume that an infinity in quality can be reduced to quantitative claims. Furthermore, it has not been shown that having size (something akin to what we would call 'cardinality') is a necessary feature of a true infinite. On the contrary, as discussed above, Cavendish holds that infinity cannot have determinate size (e.g., PL: 6; OEP: 130). In conclusion, the nested model cannot be right.

I propose instead what I call the *containment-by-respect* model. To clarify this model, it is helpful to go back to Galileo's paradox.[15] Consider the collection of squares of natural numbers, the collection of even natural numbers, or the collection of natural numbers divisible by three, and so on. Each of these collections is a proper subset, or part, of the set of natural numbers: only some natural numbers are squares, only some are even, and so forth. However, despite being proper parts, these collections can be put into a one-to-one correspondence with the set of natural numbers without remainder. This leads to a paradox: if the collection of squares of natural numbers is a proper part of the set of natural numbers, and if a whole is always greater than any of its proper parts, then it should follow that the set of natural numbers is greater than the set of squares of natural numbers. Yet, since the two can be paired one-to-one, it also follows that they are equal in size. This is Galileo's paradox.

Galileo resolves the paradox by restricting the scope of the axiom: the whole is always greater than any of its parts. The axiom holds for finite quantities, but not for infinite ones. Collections with infinitely many members are neither larger nor smaller than one another, as they are not subject to *size* in the usual sense; operations like addition, division, and subtraction do not apply to them in the same way they do to finite sets. Thus, in Galileo's account of infinity, the

15. While there is no direct evidence that Cavendish read Galileo's *Two New Sciences*, *Philosophical Letters* shows familiarity with Galilean problems, and she does refer to Galileo on multiple occasions (PL: 435, 444).

set of natural numbers ≥ 12 is *not* larger than the set of natural numbers ≥ 15. Cavendish accepts this solution.

However, note that Galileo's solution undermines the claim that the collection of square numbers, or the collection of even natural numbers, are *proper parts* of the collection of natural numbers. This claim rests on the axiom that the whole is always greater than any of its parts, but since the axiom is rejected by Galileo, we would now be in need of a different argument to support the claim that they are proper parts.

If my proposal of containment-by-respect is correct, then Cavendishian infinity diverges from a proper-parts treatment of her commitment to infinities within infinity. Consider again the view that there is infinite in time. What does it mean for infinity in time to be a proper subset of the infinity of matter? Cavendish makes it clear that it is essential for a part to be less than its whole—but this is a feature that applies to finite, and not infinite, things. Thus, if infinity in time were a proper part of infinite matter, infinity in time would necessarily be finite. Strictly speaking, then, Cavendish's Infinite Matter does not contain multiple infinities as proper parts; rather, these infinities exist within Infinite Matter as respects of its features.

To clarify the point, consider the following analogy. In Cavendish's containment-by-respect model, number 16 belongs to the infinite set of natural numbers *insofar as* it is a natural number, to the set of squares *insofar as* it is a square, to the set of even numbers *insofar as* it has that property, and so on. Cavendish's examples corroborate the containment-by-respect view. Thus:

> Suppose a Line to be extended infinitely in length, you will call this Line Infinite, although it have not an Infinite breadth: Also, if an infinite length and breadth join together, you will call it an infinite Superficies, although it wants an infinite depth, and yet, every infinite, *in its kind*, is a perfect Infinite. (PL: 9)

An infinite line is infinite qua line, regardless of its breadth, and an infinite surface is infinite qua surface regardless of its depth. Each is infinite in its own kind. This shows how infinite containment works: if we take an infinite surface, we can accurately describe it as infinite with respect to its width and breadth and finite with respect to its depth. If so, we can describe the infinite surface as properly containing an infinite width.[16]

16. Note that if we extend the example into three dimensions, considering an infinite cuboid (more precisely, a 3-orthotope, since Cavendish's concept of infinity does not allow for size comparisons, so length, breadth, and depth cannot be considered equal), we would need to take a four-dimensional perspective. While we can understand an infinite line or surface from a three-dimensional perspective, an infinite cuboid becomes formless. This is instructive for Cavendish's notion of the figure of infinite matter.

Thus, on the containment-by-respect thesis, an infinite thing can contain another infinity in respect of (or relative to) some feature that infinite Matter has, such that an infinity can 'contain' different infinities relative to different respects (or, in Cavendish's terms, 'kinds' of infinities). In that case, it is entirely possible for there to be things that are infinite with respect to *some thing* and finite with respect to *some other thing*. For instance, consider a surface that is infinite in length but finite in depth. Strictly speaking, this surface is both finite (relative to its depth) and infinite (relative to its length).

Thus, when Cavendish claims that infinite Matter 'contains' other infinities, or that 'several Infinites conclude in One Infinite,' I take her to mean that matter is infinite in the respects proper to it, by virtue of the kind of thing it is. She writes:

> [A]ll those several Infinites conclude in One Infinite, like as several Letters conclude in one Word, several Words in one Line, several Lines in one Speech, and these several Letters, several Words, several Lines in one Chapter, so several Parts, several Figures, several Motions in one Matter, and several Infinites in one Infinite Body. (PPO: 7)

The identity of the chapter depends on its lines, just as the identity of the word depends on its letters. Seen this way, the analogy can be extended to the infinity of matter. Matter is infinite in the respects proper to it, since the nature of materiality determines the ways in which it is unlimited. Thus, matter's infinity just is its unboundedness with respect to its constitutive parts, its self-motion, its effective parts, and its corporeal substance (quantity). Consequently, natural, material infinity and divine infinity indeed cannot 'obstruct or hinder each other' (PL: 8): they have different natures and are thus unlimited in the respects that pertain to each.

The containment-by-respect model also clarifies Cavendish's claim that there are several 'kinds of infinities.' The view is not that distinct, independent infinities exist in nature. Rather, given the infinite nature of matter, each feature of matter—its bulk, its parthood structure, and so on—can be infinite in its own right. The infinities are ways in which the infinite nature of matter is expressed through its various features.

We can now resolve the above paradox: given containment-by-respect, we have different kinds of infinities that coexist unproblematically within Infinite Matter, as each is infinite in its own respect or feature. Instead of one being a proper part of another, each infinity is 'contained' relative to the way it expresses the infinite nature of matter. Thus, the view that matter is infinite no longer conflicts with the claim that there is a multiplicity of infinities within matter.

## 4. The Infinite Grounds the Finite

In this section, I argue that the infinity in number (or in multitude) of the effective parts of matter grounds the finitude of each part. Cavendish states:

> Infinite body, as Nature, or natural Matter, must *of necessity* be dividable into infinite parts in number, and *yet* each part must also be finite in its exterior figure. (PL: 457; italics mine)

Cavendish defends the seemingly obvious claim that each part is finite in figure via the perhaps less obvious route of establishing that the Infinite Body must necessarily be divided into infinitely many parts. To understand her argument, suppose, with Henry More—to whom Cavendish responds on this point in *Philosophical Letters*—that we divide a body of infinite magnitude into a finite number of equal parts. As More observes, this leads to absurdity (More 1659: 8–10).[17] If an infinite magnitude is divided into three equal parts, each part must be finite since it is bounded by the others. Yet at least one of them must also be infinite; otherwise, their sum would be finite. But if one part is infinite, then they are no longer equal, contradicting our initial assumption. Cavendish agrees but also objects to More in the following way:

> I answer, That Matter is not dividable into three equal parts, for three is a finite number and so are three equal parts; but I say that Matter being an Infinite body, is dividable into Infinite parts, and it doth not follow, as your *Author* says, That one of those infinite parts must be infinite also, for there would be no difference betwixt whole and its parts. (PL: 157)

As is often the case with Cavendish, her response initially seems uninformative but, on reflection, it gains philosophical weight. More's argument assumes that an infinite body can be divided into a finite number of equal parts. Because we draw conclusions from this assumption, such a division must at least be possible. Cavendish's point is that this supposed possibility is an illusion: it is in fact impossible for an infinite thing to be divided into a finite number of parts.

Yet to deny that an infinite thing can be divided into a finite number of parts, while maintaining that it must be divisible, is to conclude that it must be divided into infinitely many parts. An objector might argue that Cavendish's reasoning is circular, as it assumes the impossibility of dividing the infinite into finite parts. The worry is fair, but it would not trouble Cavendish: if matter is infinite, then it

17. More's point in the passage discussed by Cavendish is that some of the paradoxes that arise regarding the infinite divisibility of extension should not be found too troublesome. Cavendish ignores this point and challenges instead what she takes to be a metaphysical blunder.

*must* be divisible into an infinite number of parts. No other division is possible or even conceivable.

Cavendish provides a connected, yet distinct, reason for the conclusion that an infinite body can only be divided into an infinite number of parts. She argues that since the Infinite Matter is the cause, it can only produce infinite effects:

> [F]or since the cause, which is the onely matter, is infinite, the effects must of necessity be infinite also; the cause is infinite in its substance, the effects are infinite in number. (PL: 521)
>
> [N]ature being an infinite body, must also have infinite parts; and having an infinite self-motion, must of necessity have an infinite variety of parts. (OEP: 164)

From an infinite cause, only infinite effects follow. If this were not the case, the cause would be intrinsically limited (and, strictly, intrinsically self-limiting) in some way and would thus cease to be properly infinite.

Here is another reason in favour of the claim that Infinite Matter can only be divided into an infinite number of parts. On the containment-by-respect model, this could be true in one of two ways: this could hold in two ways: either matter is properly infinite in all respects, in which case having parts entails infinitely many parts, or matter is infinite only in some respects, one of which concerns its parts. Suppose that matter is infinite in some respects but finite with respect to its parts. Cavendish rejects the view as absurd: the 'infinite whole, … being infinite in bulk, must of necessity also consist of infinite parts' (OEP: 206; see also OEP: 164). A further problem arises for this scenario. To claim that matter is infinite in some respects but finite in others requires a principled demarcation rule specifying which respects are infinite. Without such a rule, the claim becomes arbitrary and loses explanatory force. This proposal also effectively denies infinity to matter itself: if only certain features of matter are infinite, then matter as a whole cannot be considered infinite. Thus, the only way to preserve the claim that infinite matter produces infinitely many effects is to allow that matter is infinite in all respects proper to it.

Since infinite matter *cannot* be finitely divisible, and by its nature as matter, must be divisible, it follows that it is infinitely divisible: it is necessarily divided by an infinite number. From this, Cavendish concludes that necessarily each part would be finite (in figure). Here is why: to divide is to create distinct parts with boundaries. If a part were to remain infinite after division, then it would have to lack boundaries (by Cavendish's definition of infinity). If a part lacks boundaries, then it is not a proper 'part' but is a whole. So, dividing infinity into an infinite number of parts results in each part being finite. Thus, the finitude of each of the parts (the effects) is grounded in the infinity of matter (the cause). In other

words, it is because the Infinite Matter can only be divided into infinitely many parts that there are finite bodies in the world.

Thus, in Cavendish's system, the (effective) parts of matter are, necessarily, infinite in number and necessarily finite in figure (e.g., PPO: 6; OEP: 257). The latter claim should be understood as strictly as the former: being a member of a collection of infinitely many parts is an intrinsic feature of each part of matter. In this sense, we are justified in describing each part as infinite, since for a part to be a part of matter, it must belong specifically and necessarily to an infinite material multitude (e.g., PL: 6; OEP: 102).

Finitude, then, turns out to be parasitic on infinity: the finitude of the parts is metaphysically dependent on the infinity of their number. This also explains Cavendish's rejection of atomism on the basis of the impossibility of single parts.[18] If it were hypothetically possible to remove a single part from the infinity of parts, that part would lose the ground of its finitude. Not only would it no longer qualify as a part, but it could not conceivably be considered an atom, since it cannot be strictly finite.

## 5. Matter Must Be Infinite

So far, we have seen what makes something infinite, how we can allow for a multiplicity of infinities in the Infinite Matter, and how the infinity of matter grounds the finitude of the material parts. But there is a question lurking in the background: could Cavendishian matter *not* be infinite? Is its infinity a contingent or necessary feature? In this section, I defend the necessity view: matter must be infinite.

Some commentators (e.g., Boyle 2018) explain the infinity of matter theologically: since God is infinite, His actions must also be infinite, and since His chief action is the creation of Nature (or Matter), Matter itself must be infinite. Formulated this way, the argument is supposed to establish the necessity of infinity.

The strength of this justification depends on how strictly Cavendish separates theology from (natural) philosophy (e.g., PL: 3–4, 12, 210–1, 491). Scholars disagree. Boyle (2018: 118) argues that Cavendish does not entirely reject appeals to God in natural philosophy, although she strongly dislikes them. Shaheen (2021) follows suit. In contrast, Detlefsen (2009), Cunning (2016), and Lascano (2023) are far more sympathetic to the exclusion of explanations based on God's nature or existence. I agree. In my view, for Cavendish, theses defended by appeal to God must always be mere supplements to arguments from 'rational inquisition' (e.g., OEP: 158), for two reasons. First, given the intellectual context of Cavendish's

18. For a discussion, see Shaheen (2019).

natural philosophy, it would have been strategic to support claims with theological arguments for credibility. However, such arguments cannot be conclusive, as they would fall outside what is strictly rationally knowable by material things, and thus outside natural philosophy (e.g., PL: 529; OEP: 255). Second, theological arguments cannot serve as the final word because our knowledge of God is limited to affirming God's existence and His role as the 'author' of nature (e.g., OEP: 89, 193). Since we cannot know God's nature and reasons for actions, theological justifications would also have to be uncertain at best. Additionally, in some circumstances what might initially appear to be theological explanations fail to be so, precisely because we are epistemically limited in accessing God.

Consider the argument that supposedly moves from the infinity of God to that of Matter via the necessity that His actions are infinite. Where does it draw its explanatory force? The argument makes sense not because there *is* a God but because God is *infinite*. For all these reasons, I agree with Cunning (2016) that Cavendish uses theological arguments as strategic tools for persuasion and not as arguments for philosophical foundations. We should be wary of concluding that attributing the infinity of matter to God's actions would have convinced her of its truth.

The absence of an explicit argument for the infinity of matter leads McNulty (2018: 234) to suggest that, for Cavendish, material infinity is a brute fact: a fundamental feature of nature that cannot be demonstrated. Since Cavendish does not explicitly reject brute facts, this reading has initial warrant and some textual support.[19] Moreover, it appears to have some textual support:

> [N]ature, being eternal and infinite, it could not be known how she came to be such, no more than a reason could be given how God came to be. (OEP: 23)

However, we have good reasons to resist McNulty's solution. First, Cavendish's statement above points to an epistemic brute fact, not to an ontological one. Second, the issue at stake is not the infinity of matter (or its eternity), but the *manner by which* it came to be so, specifically, the action by which God brought matter into existence. Third, if the infinity of matter were a brute fact, then it would also be metaphysically possible for matter to be either finite or neither infinite nor finite. Cavendish implicitly excludes the latter and explicitly rejects the former. Matter must be really and properly infinite. In short, I do not find McNulty's solution sufficiently compelling.

19. Although McNulty classifies it as 'brute fact', I suspect that the appropriate description is primitive fact: 'There are no preceding propositions from which the infinitude of nature is derived' (McNulty 2018: 234).

In contrast to McNulty, I believe that Cavendish offers reasons for matter's being infinite. As we have seen, if there are infinitely many effects, then there must be an infinite cause: a finite material cause (a finite body) cannot produce infinitely many effects (OEP: 31, 164, 211). Cavendish is explicit about this: 'it is against sense and reason, that a finite [material cause] should have infinite effects' (OEP: 31).

Moreover, she argues that the idea of a finite material cause producing infinitely many effects arises from a confused understanding of the infinite divisibility of matter. Mathematically, a continuous material quantity is infinitely divisible, regardless of whether the initial quantity is finite or infinite. This means that a finite body can theoretically be divided into smaller and smaller parts *ad infinitum*.[20] While the mathematical truth may hold, Cavendish objects to its extrapolation to Matter. For Cavendish, the mathematical infinite divisibility of a continuous body presupposes the metaphysically impossible existence of 'single' parts—parts that could exist independently while still belonging to a whole (e.g., OEP: 18; 32, 124, 127, 155, 160). If division meant creating smaller and smaller parts existing singly, it would be impossible. Instead, any division must involve composing the divided parts with others. Thus, a finite body producing infinitely many effects would have to engage in endless composing and dividing, which Cavendish concludes would require the body to be eternal (OEP: 32). Since an eternal body is also infinite, a body capable of producing infinitely many effects must itself be infinite.

Nevertheless, arguments that rely solely on the existence of infinitely many effects cannot be compelling, because we cannot establish *a posteriori* that infinitely many effects actually exist. Establishing *a priori* that there is (or must be) an actual infinity of effects requires moving from claims about the nature of the cause to conclusions about effects. On my reading, this is precisely Cavendish's approach: the infinity of effects is guaranteed because matter is infinite.

A Cavendishian *reductio ad absurdum* supports this conclusion. Suppose matter is finite. To be finite is to be bounded. The possible bounds are: (1) vacuum, (2) something immaterial, or (3) something material. Each leads to an absurdity. So, Matter is necessarily infinite. To unpack: vacuum cannot limit matter because vacuum does not exist (e.g., OEP: 55; 102; 129). An immaterial boundary would require causal interaction between the material and the immaterial, which Cavendish rejects (e.g., OEP: 35). If the boundary were material, then that would really constitute an extension of matter rather than a limit of it. Thus, Matter is infinite.

The argument aligns with Cavendish's philosophy but has two problems. The first is substantial: the argument does not conclusively establish that

20. Detlefsen calls this 'the implicit mathematical belief in the infinite divisibility of matter' and takes Cavendish to endorse it (Detlefsen 2006: 204). Shaheen (2019) objects, on good grounds.

matter *must be* infinite. It may show that matter cannot be limited by something external, but that does not rule out the possibility that matter is intrinsically self-limiting, or that it is neither finite nor infinite. However, these possibilities can also be ruled out. Matter cannot be self-limiting because, if it were, then matter qua cause would no longer be distinguishable from its effects, as both would be intrinsically self-limiting. Matter also cannot be the kind of thing that is neither finite nor infinite, since matter is essentially composed of parts, and each part is intrinsically finite. While it is true that one could make the argument that the finite and the infinite need not be logical opposites, Cavendishian matter must nonetheless have one or the other. If matter were neither finite nor infinite, then finite effects would lose their metaphysical ground for finitude. The completed *reductio* now shows that matter cannot be finite, so indeed, matter *must* be infinite.

The second worry is methodological. The argument lacks direct textual support—to my knowledge, Cavendish does not explicitly present this argument. However, given that she rarely systematises her views into structured arguments, this is unsurprising. Although Cavendish's philosophy is not presented as a deductive structure of interconnected propositions, this does not mean that it is not so, or that she herself does not understand it to be so. In response to a similar objection brought against her philosophy, Cavendish claims:

> [I]f this philosophy of mine were both groundless, and immethodical, I could not with reason expect my readers should … consider *the connexion and mutual dependence of my several opinions.* (OEP: 21; italics mine)

I take Cavendish here to invite her readers precisely to do the work of finding the connections and dependence of her philosophical ideas, that is, the very argumentative structure that informs her views. So, I find the attempt at producing a Cavendishian argument for material infinity warranted. And, since each substantial premise can be directly found in her writings, it remains highly plausible that she would have endorsed it.

## Conclusion

For Cavendish, matter is necessarily infinite in an unrestricted sense. She argues that the infinity of matter grounds the existence of several other infinities—the natural infinities that can properly be attributed to matter insofar as it has effects. These infinities are contained within the 'One Infinite Matter' on a respect-based model: this Infinite Matter can contain different kinds of infinities, each defined in relation to a particular aspect. For example, considered in terms of multitude,

Infinite Matter contains an infinite number of parts. This infinite division into parts has a corollary: while the number of parts is infinite, each part itself remains finite. In this way, Cavendish derives finitudes from infinity, and multiplicity from unity—but only on condition that the finite is grounded in an infinity (in the case of parts, an infinite number). Because of this intrinsic relation, no finite part can be separated from the infinite whole. If a part were separable, it could no longer be finite or a part. Thus, Cavendish grounds the necessary relationality of the finite parts of Nature (i.e., her rejection of 'single parts') on one of the respects in which Infinite Matter is infinite. This is how Infinite Matter serves as the ground of her natural philosophy.

## Competing Interests

The author has no competing interests to declare.

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