Margaret Cavendish on matter and metaphysical structure

ABSTRACT:

This paper provides an interpretation of Cavendish's claim that everything that exists in nature is matter. I argue that it is a rejection of substance-property ontology and similar ontologies, which are structured by dependence and inherence. It is an affirmation of a nonhierarchical ontology, which is structured by parthood and composition. It is not, as Cavendish's materialism is usually interpreted, the claim that more often goes under the label 'materialism': that there are only certain kinds of substances, where those kinds are best understood in terms of the properties they have.

Abbreviations:

Margaret Cavendish, *Philosophical Letters [PL]* (London, 1664).

Margaret Cavendish, *Observations on Experimental Philosophy [OEP]* Edited by Eileen O'Neill Cambridge: Cambridge University Press, 2003.

Margaret Cavendish, *Grounds of Natural Philosophy. [G]* (London, 1668.).

0 INTRODUCTION[i]

Perhaps the central pillar of Cavendish's later philosophical system, as articulated in the *Observations upon Experimental Philosophy* (1663) and the *Grounds of Natural Philosophy* (1668), is that all that exists in nature is matter: 'all that is natural,' she writes, must also be material or corporeal' (OEP 253). I will call this Cavendish's 'materialism.'

Cavendish also claims that all change is motion, and identifies all natural phenomena as 'corporeal figurative motions' (e.g. OEP 31, 35, 77). This rhetoric, familiar from her mechanist contemporaries like Descartes, Boyle, and Hobbes, might lead us to imagine that she holds that all that exists are extended bodies with geometrical properties, and that all variety and change are grounded in the arrangements of those bodies and their local motion. It also might lead us to assimilate Cavendish with other materialists throughout history and with their contemporary cousins, for whom materialism is a kind of monism, which is to say a commitment to the claim that there is only substance with certain (material or physical) properties.

I argue in this paper that this is not what Cavendish's materialism means. Instead, Cavendish's claim that everything is matter is an endorsement of a particular kind of fundamental ontology. It is a denial that there is anything like substance-property structure, or what I will call more generally 'inherence structure', which posits fundamentally different levels of being, specifically dependent beings, beings that can only exist in another, or things with partial but not full being. Cavendish's materialism is an endorsement of what we may call a nonheirarchical or one-category ontology, which is structured not by inherence but by parthood and composition.

In the first section of this paper, I pose the question: what motivates Cavendish's materialism? In the second section, I outline Cavendish's arguments against what I call 'inherence structure'. In the third and fourth sections, I explain her positive account of structure, arguing along the way that she rejects the mechanist alternative to inherence structure. In the fifth section, I argue that matter is just divisible stuff, and describe Cavendish's account of parthood and composition.

1 MATERIALISM AND PROPERTIES

It is natural to read Cavendish's claim that 'there is no part of Nature…which is not matter' as the claim that there are entities of a certain kind - namely, material ones - and no entities of any other kind, which is to say, no immaterial entities. For example, Cavendish's materialism has been described as the claim that 'there are neither incorporeal substances nor incorporeal qualities in nature.'[ii]

If this were the right way to understand Cavendish's materialism, our next question should be: what kinds of entities does it admit, and what kinds does it exclude? Cavendish's frequent claims that all natural phenomena are ultimately just so many 'corporeal figurative motions' invite a comparison between Cavendish and the mechanical philosophers whose work she carefully read and engaged with, including Descartes, Boyle, and Hobbes. All three characterized matter as a substance with certain kinds of features.[iii] Exactly what a 'feature' is - quality, affection, mode, attribute - and which features exactly matter has were matters of some debate, but they always

included those related to a body's extension, like shape and size. According to mechanism, broadly construed, natural phenomena are all explicable in terms of the local motion and arrangements of these bits of matter, and all fundamental change is local motion, or change of place.

Most mechanists, including Descartes and Boyle, were not materialists, although they can usefully be understood as explanatory materialists within a certain domain. Hobbes was a materialism - the most prominent one at the time - and an important influence on Cavendish. The Hobbesian fusion of materialism and mechanism was sometimes identified as materialism itself. For example, in his widely-read 1729 *Philosopisches Lexicon*, J. G. Walch defines materialism as the claim that 'all the occurrences and operations of natural bodies are derived from the bare properties of matter, as from its dimension, shape, weight, confrontation and mixing.'[iv]

Mechanist materialism is not Cavendish's brand of materialism. For one, while most mechanists held that matter is inert, Cavendish held that matter is self-moving, which is to say, it causes changes in itself (e.g. OEP 85, 125, 131, 208). In fact, according to Cavendish, *all* motion is self-caused (OEP 28, 112, 113, 131).[v] A body can only cause changes in itself, and not in other bodies, although one body can serve as the occasion for the self-motion of another. To use Cavendish's example, the motion of a hand tossing a ball is really just the occasion for the ball to launch itself into the air (OEP 140).

Cavendish is unusual but by no means unique among early modern materialists in holding that matter is active: Gassendi, Glisson, Toland, La Mettrie and others held, as Charles Wolfe has put

it 'either a specifically vital sense of matter, and/or a naturalistic openness to the fact that the description of the natural world is not, in the end, going to be a matter of pure physics.'[vi] And Wolfe's description of this kind of materialist as holding that matter may not be as it is described by pure physics points us to another way that Cavendish's materialism departs from mechanism. For in addition to holding that matter is self-moving, Cavendish also was extremely critical of what we might (anachronistically) call the methods of physics: of experimental methods like microscopy, of applied mathematics, and of induction. Peterman (2019) develops these critiques, but the basic idea is that these methods all represent hopeless human attempts to bootstrap ourselves out of our highly limited perspective on nature, which 'conceited prerogative' (PL 114) Cavendish identifies as one of the greatest sources of philosophical error (PL 146-147).

So despite her reduction of natural phenomena to 'corporeal figurative motions,' Cavendish's materialism is not motivated by the special explanatory status of a certain class of properties, whether they are specified as, say, size and shape, or whether the list is left to current or future physicists to fill out. And her materialism is not, first and foremost, an attempt to render the mind and other mysterious phenomena tractable by science. In this, Cavendish also differs from contemporary physicalists, who do not share with mechanists and mechanist materialists like Hobbes the same conception of the physical, but do share the motivation to explain all phenomena in terms of physical science.

Besides self-motion, Cavendish claims that matter has what she calls 'sense' and 'reason'. This has led many readers to characterize her conception of matter as 'intellectualized,'[vii] 'anthropomorphic'[viii], and 'cognitive'[ix]. These commentators note that this distinguishes her from

many materialists (although, as Wolfe's work establishes, not all of them), and they interpret her materialism as a kind of panpsychism.[x] Some of these interpreters gloss her view as a kind of mechanist-materialism-plus, where matter has the modes of extension as well as these extra mentalistic properties.[xi] As I will argue in Section 5, this is not right because by 'figure' and 'motion' Cavendish does not mean geometrical figure and local motion.

Others suggest that Cavendish's is such a unique kind of materialism that the label is misleading, and we should think of her instead simply as a monist.[xii] But this, too, has it that Cavendish's materialism involves a specification that there are substances of a certain kind and not substances of other kinds, and that the kind is fixed by the kinds of features it has. All of these interpretations are as much an artifact of Descartes's framing of dualism in terms of primary attributes or Boyle's characterization of matter in terms of the mechanical affections as it is of the the language of contemporary physicalism. In his overview of physicalism in the *Stanford Encyclopedia of Philosophy*, Daniel Stoljar canvasses many versions of physicalism, characterizing almost every one in terms of the relationship between physical and nonphysical properties.[xiii]

I do not think we should understand Cavendishean matter as a kind of substance at all, especially not if we understand that kind of substance in terms of the properties it has. To that extent, it is misleading even to characterize it as any kind of monism. One important reason for this is that Cavendish entirely rejects the existence of property-like entities, and attempts to reduce substance-property structure to other kinds of metaphysical structure. The next section presents her arguments for this.

2 AGAINST INHERENCE STRUCTURE

Cavendish criticizes explanations of natural phenomena that appeal to accidents, forms, qualities, modes, and the like, targeting both historical philosophers and her contemporaries. Her rejection of such explanations is not unique among her contemporaries; however, it is much more thoroughgoing. I argue in this section that Cavendish rejects all inherence structure, starting, in 2.1 and 2.2, with her critique of accidents. Section 2.3 generalizes her rejection of accidents to all inherence structure.

2.1 Against accidents

Cavendish discusses accidents throughout her *Philosophical Letters* and in the 1668 *Observations upon Experimental Philosophy*. She does not mention them in the *Grounds*, because unlike the *Letters* and the *Observations*, the *Grounds* does not spend significant time assessing the views of other philosophers, and accidents play no role in her own metaphysics.

Cavendish does not provide a precise definition of accident - indeed, she contends that she does not know what people mean by the word 'accident' (OEP 48). But the accounts of accidents that she attacks, as she understands them, have two main points in common.

First, accidents are ontological posits which play a role in natural philosophical explanations, particularly in accounts of the qualitative character of substances, and changes in those characters. Examples of purported accidents that Cavendish gives include motion, color, magnitude, rarity, and disease.

Second, as Cavendish understands them, accidents are believed by their defenders to be *entities* that are not *matter*. Following Thomas Stanley, she attributes to Plato the view that accidents are incorporeal (OEP 253). This makes them 'no substances, or bodies, but…something between body and no body,' as in the version of the view she attributes to Aristotle (OEP 271). It is the conception of an accident as something in between body and nothing that is Cavendish's main target; accidents are 'beings, which are neither corporeal nor incorporeal, but between both' (OEP 275).

Cavendish is elsewhere more specific about the sense in which accidents are 'between body and no body': accidents are supposed exist, but to depend upon bodies for their existence. In the Argumental Discourse of the OEP, Cavendish's latter thoughts - who usually present considerations that challenge Cavendish's settled views - propose that motion is an accident, where 'an accident was something in a body, but nothing without a body' and which 'cannot subsist of, and by itself…as a substance: for, although it hath its own being, yet its being is to subsist in another body (OEP 36).'

Where is Cavendish's target coming from? At least one source is Thomas Stanley's *History of Philosophy in Eight Parts*, from which she gleans Plato's and Aristotle's accounts of accidents.

She was also familiar with Hobbes's discussion of accidents in *De Corpore*, with Boyle's *On the Origin of Forms and Qualities*, and with Jan Baptista Van Helmont's in *A Ternary of Paradoxes*, all three of which she addresses directly in her critical work. It is less clear how acquainted Cavendish was with the centuries-long Scholastic debates over the nature and existence of accidents.

But while she is not attempting to do justice to this complex history, she is certainly picking up on its central theme, and Stanley's interpretations of ancient doctrines of accidents, as well as Hobbes's, Boyle's, and Van Helmont's treatments of accidents, are deeply informed by those debates. An accident was typically considered to be an entity with a special kind of being, distinct from the being of a substance. This distinct kind of being, which was sometimes called 'diminished' being, was related to the fact that an accident is essentially dependent on a substance, and related to it by inhering in it. In the early days of accidents, that dependence meant that an accident could not exist separately from a substance. This changed with the emergence of the theory of real accidents, associated most closely with John Duns Scotus, according to which accidents, while still dependent entities, could be separated from the substances in which they inhered. Jan Baptista Van Helmont endorses this kind of position, writing that 'the same numerical Accident can pass from one subject to another.'[xiv]

Cavendish denies the coherence of separable accidents, arguing that anything that has essentially dependent being is inseparable from the thing on which it depends: 'If an accident was nothing without a body, or substance,' Cavendish writes, then 'how could [it]…be separated from another body?' (OEP 36). She makes similar points specifically about color and about motion (OEP 36,

PL 308). So if there are accidents understood as dependent beings, they are inseparable from the matter that bears them.

But Cavendish denies the existence of *inseparable* accidents, too. This follows straightforwardly from her principle that since there is 'no such thing as a mean between something and nothing, that is, between body and no body in nature' (OEP 231), anything that exists must be 'something or nothing, body or no body, substance or no substance' (PL 2.24). 'If an accident be something,' Cavendish writes, 'then certainly it must be a body' (OEP 36). Accidents, understood as essentially dependent or diminished beings, do not exist.

2.2 Real accidents?

So color, motion, heat, smell, and so on, if they exist, must be matter. This leaves open the possibility that they are matter distinct from their bearers. On this interpretation, these accident-candidates exist, but they are not diminished in any way; they are full-fledged matter of their own. This would be analogous in some ways to the Scotean view that there are real accidents, which have full-fledged entity and are separable from their bearers.

There are several passages that suggest that Cavendish thinks of accidents like this. One such passage comes in Cavendish's reply, in her *Philosophical Letters*, to the following characterization of inherence from Hobbes's *De Corpore*:

> An accident's being said to be in a body is not to be taken as if something were contained in that body - as if, for example, redness were in blood the way that blood is in a bloody

> cloth, that is, as a part in the whole; for if so then accident would be a body, too. Instead, just as size, rest, or motion is in that which has the size, or is at rest, or moves (everyone understands how this is to be understood), so too every other accident's being in its subject ought to be understood (*De Corpore* 8.3).[xv]

Here is Cavendish's reply:

> I answer…that redness is as well in blood, as blood is in a bloody cloth, or any other colour in any thing else; for there is no colour without a body, but every colour hath as well a body as any thing else, and if Colour be a separable accident, I would fain know, how it can be separated from a subject, being bodiless, for that which is no body is nothing… (PL 1.16).[xvi]

Cavendish's claim here that color is 'in blood as blood is in a bloody cloth' suggests that she does take color to be a real thing, distinct and separable from its bearer, and joined to it by composition, as a part is joined to other parts.

Moreover, Cavendish gestures at some arguments for the reality of accident-candidates like color, heat, and motion that seem to echo historical arguments. In his *History*, Stanley reports the Stoic position on accidents and qualities as follows:

> Qualitatives have a subsistence, and are separate from their subjects. For qualities (as all other accidents) are bodies, seeing that according to Zeno [of Citium], nothing can be effected by that which is incorporeal, nor can that which is incorporeal effect any thing; whatsoever effecteth is a body. Effective quality therefore is a body.[xvii]

Again, Stanley is Cavendish's primary source for the history of philosophy, and it is clear that Stoic doctrines influenced various aspects of her system, including her account of mixture, her

early endorsement of a pneuma, which would later become animate matter, and her claim that the cosmos is eternal and infinite.[xviii] So she knew this passage.

Stanley's retrospective gloss on the Stoic account would have been colored by the Scholastic treatments of accidents, as would the mechanists' understanding of accidents. So while it is not clear that Cavendish is familiar with it directly, it is worth taking a look at an influential argument that Scotus gives for real accidents:

> Accidents are principles of acting and principles of cognizing substance…and are the per se objects of the senses. But it is ridiculous to say that something is a principle of acting…and yet does not have any formal being (*entitatem*).[xix]

Scotus argues that accidents must have being or entity because (1) they are principles of cognizing and sensing substances, and (2) they have causal efficacy. But anything that plays those roles must be a being. The passage from Stanley above attributes something like an argument for (2) to Zeno, except that for the Stoics, just as for Cavendish, the only kind of entity is the entity of matter.

In an amusing discussion of Van Helmont's account of disease in her *Letters*, Cavendish seems to argue along similar lines, from the causal efficacy of qualities to the claim that they are matter:

> A disease is a real and corporeal being, and…not an abstracted quality…for no immaterial quality will do any hurt, if it be no substance…wherefore apoplexy, leprosie, dropsie, and madness, are corporeal beings, as well as the rest of diseases, and not abstracted qualities, and I am sure, persons that are affected with those diseases will tell the same (PL 350-1).

Elsewhere in the *Letter*s, she alludes to an argument from perceivability:

> [A]s for colours, scents, light, sound, heat, cold, and the like, those that believe them not to be substances or material things, surely their brain…moves very irregularly…for what objects soever, that are subject to our senses, cannot in any sense be denied to be corporeal (PL 12, see also G 12).

Finally, from both, which are related to one another by Cavendish's account of perception:

> [A]ll objects are material; for, were light, colour, figure, heat, cold, etc. immaterial, they would never be patterned out by corporeal motions: for, no painter is able to copy out, or draw an immaterial mode or motion; neither could immaterial motions make pressure, nor be subject to reaction (OEP 177).

These passages suggest that the accident-candidates in question, like motion, color, disease, and so on, have have causal and explanatory import, that nothing that is not matter can have causal and explanatory import, and so they must exist and be matter.[xx]

Does Cavendish hold, then, that color, motion, figure, place, disease, and the like are matter distinct and separable from the matter that bears them, as real accidents were considered to be distinct and separable from the substances in which they inhere? This is an interesting position, and these passages reflect that it more congenial to Cavendish's metaphysics than the view that accidents exist but are not matter. However, I think that we should not take this to be her considered position.

The argument against Hobbes can be read as a *reductio*: *if* red is an accident, *then* it is in blood as blood in a bloody cloth. But it is not, etc. Cavendish gives an analogous argument in the

Letters against what she takes to be Descartes's claim that motion is a mode that can be transferred from one body to another:

> …motion being material and inseparable from matter, cannot be imparted without matter; and if not, then the body that receives motion would increase in bulk, and the other that loses motion would decrease…the contrary whereof is sufficiently known (OEP 74-5, see also PL 1.30).

If a quality can exist separately from the body that has it, then it must be matter that is separate from the matter that has it. But we do not find that bodies gain and lose bulk when they lose qualities like motion and color, so qualities are not separable from the bodies that have them.

In the *Observations*, Cavendish rejects the possibility that 'motion be corporeal', along with body. Rather, a body and its motion 'were not two several substances; but motion and matter made one self-moving body; and so was place, color, figure, etc. all one and the same with body' (OEP 37). Similarly, from the 1663 edition of her *Philosophical and Physical Opinions* she clarifies that 'By Change of Motion, I do not understand Change of Matter, but Change of Motion in one and the same Part of Matter' (PPO 33).

This also seems to be her view of color. In the Argumental Discourse, where she claims that when a body is divided into very minute parts, its color 'is divided as well as the body' (OEP 37). The passage critiquing Hobbes can also be read in a way that is consistent with the view that a body's color is identical with the matter that bears it. That passage continues: 'as for natural color it cannot be taken away from any creature, without the parts of its substance or body; and as for artificial colors, when they are taken away, it is a separation of two bodies.' If natural color is

separated from its bearer, then parts of the body of the bearer must be separated from it. This suggests that natural color is not matter distinct from its bearer, but rather identical to its bearer. The removal of artificial color does involve the separation of the bearer from another body, but this does not mean that the artificial color itself is a bit of matter. Rather, there is another body out there - say, paint - that is identical with its color, and the removal of artificial color from a substance is like stripping paint from the house.

As for seemingly less fundamental qualities, Cavendish does not characterize them as matter distinct from their bearer, but as so many motions. For example:

> The third question was, Whether all that they name qualities of bodies, as thickness, thinness, hardness, softness, gravity, levity, transparentness and the like, be substances? I answer, That all those, they call qualities, are nothing else but change of motion and figure of the same body, and several changes of motions are not several bodies, but several actions of one body; for change of motion doth not create new matter or multiply its quantity: for though corporeal motions may divide and compose, contract and dilate, yet they cannot create new matter, or make matter any otherwise then it is by nature, neither can they add or subtract any thing from its nature (PL 1.43)

As in this passage, Cavendish is more likely to treat qualities as *actions* of matter than as matter of their own: 'What they call accidents…are only various actions of self-moving matter, or a variety of corporeal motions, and so are all accidents whatsoever…' (PL 1.16)

Section 4 will explain the kind of actions that these qualities are. In the last subsection here, however, I'll argue that Cavendish's critique of accidents can be generalized to a critique of all inherence structure.

2.3 Against inherence structure

To express the idea that color and other features of bodies are identical with the matter that bears them, Cavendish often writes that these are are 'all one thing' with matter. She makes this claim about many features of bodies, including motion (OEP 73), figure (OEP 73, OEP 137), color (OEP 45), magnitude (OEP 81, OEP 128), and place (OEP 48). That motion and figure in particular are one with matter even leads Cavendish to eschew talk of body, its figure, and its motion, instead referring often to 'corporeal figurative motions': 'if you conceive matter to be one thing, figure another, and motion a third, several, distinct and dividable from each other, it will produce gross errors, for, matter, motion, and figure, are but one thing' (PL 2.6). Cavendish also insists that matter is 'but one thing' with self-motion, 'and could not so much as be conceived differently' (OEP 35, see also OEP 211). Finally, less apparently fundamental features of bodies that might have been classified as accidents are also 'all one thing' with bodies, including heat and scent, which are 'one thing with the hot and smelling body' (OEP 108), along with gravity, levity, density, and rarity (OEP 193).

Cavendish does not restrict this 'all one thing' locution to the relationship between accidents and matter. She also writes that 'form and matter are but one thing; for it is impossible to separate matter from form, or form from matter' (OEP 252-253). Similarly, of 'quality', she writes:

'Quality can no more be divided from matter, than figure, magnitude, colour, place, and the like; all which are but one and the same with body, without any separation or abstraction' (OEP 253, see also OEP 270).

Cavendish's claim that so many things are one with matter reflects a thoroughgoing antipathy to illegitimate distinctions. The illegitimate distinctions that Cavendish most often calls out are distinctions between matter and these feature-like things, like accidents, forms, qualities, and 'manners and modes' of substance:

> Nor do I understand what they mean by intentionals, accidentals, incorporeal beings, formal ratio, formal unity, and hundreds the like; enough to puzle truth, when all is but the several actions of one cause, to wit, the onely matter. But most men make such cross, narrow, and intricate ways in Nature, with their over-nice distinctions, that Nature appears like a Labyrinth, whenas really she is as plain as an un-plowed, ditched, or hedged champion (PL 489).
>
> [M]en are apt to make more distinctions then Nature doth: Nature knows of nothing else but of corporeal figurative Motions, when as men make a thousand distinctions of one thing, and confound and entangle themselves so, with Beings, Non-beings, and Neutral-beings, Corporeals and Incorporeals, Substances and Accidents, or manners and modes of Substances, new Creations, and Annihilations, and the like, as neither they themselves, nor any body else, is able to make any sense thereof… (PL 333).

Passages like these indicate that Cavendish takes her critique of accidents to apply more generally to any attempt to explain the diversity in matter and the sources of changes in it by positing new structures and entities.

This includes what Cavendish calls 'modes' of substance. She describes the distinction between a substance and its mode to be illegitimate (PL 333) and describes modes as immaterials (OEP 177) - which, as we know, do not exist. Modes are of particular interest because among Cavendish's contemporaries who, like her, rejected accidents, some found an alternative in modes. So we might ask whether, despite rejecting them by name, Cavendish accepts something like modes and the modal distinction.

Like accidents, it is difficult to characterize modes decisively, because it was a concept that was understood differently and used differently by different philosophers. Descartes's approach is a useful one to focus on because it displays some of the ambiguities inherent in the concept, and because Cavendish addressed his account of modes directly. Descartes defines a mode as a dependent entity (Descartes *Principles* I 60 / CSM II 213). He also claims that modes are beings with less perfection of reality than substances (e.g. *Descartes First Replies* / CSM II 75).

Cavendish does not accept modes under either of these descriptions: as we have already seen, nothing is essentially dependent and nothing exists with less reality than a substance. Of Descartes's identification of motion as a mode of a body specifically, Cavendish writes:

> I…do not assent to his opinion, when he defines Motion to be onely a Mode of a thing, and not the thing or body it selfe; for, in my opinion, there can be no abstraction made of motion from body, neither really, nor in the manner of our conception, for how can I conceive that which is not, nor cannot be in nature, that is, to conceive motion without

> body? Wherefore Motion is but one thing with body, without any separation or abstraction soever (OEP 97, my italics. See also PL 12, 97-98, 1.30).

So Cavendish treats modes along the same lines as accidents. She is not alone in assimilating modes with accidents and other similar entities: More, for the most part, uses ‘mode’ and ‘accident’ interchangeably, as do even Descartes and Boyle on occasion.[xxi]

There is, however, another way of understanding a mode that Descartes, Boyle, and Hobbes all draw on when they need to. On that understanding, a mode is not really a thing at all, not even a dependent thing or kinda-thing (e.g. Descartes *Principles* II 25 / CSM II 233). But even then, they treat modes as at least conceptually distinct from substances. Cavendish denies even that modes can be distinguished conceptually, 'for how can I conceive that which is not, nor cannot be in nature?' (OEP, see also PL 12, 97-98). To do so would be to follow the majority of philosophers, who are 'are apt to make more distinctions than nature doth.' But this produces 'gross errors' (PL 333); indeed, the 'chief error of the ancients' in which 'our moderns' follow them is that they 'abstract quality, motion, accidents, figure, place, magnitude, etc., from matter' (OEP 275).

If by ‘mode’ we mean just a way that matter can be, with no metaphysical commitment at all, including to a new entity, kinda-entity, or distinction of any degree including conceptual, then Cavendish thinks that there are modes. Cavendish almost never mentions modes outside of the *Letters*, where she discusses the views of others. She does not refer to modes in the *Grounds*, and uses the word three times in the OEP - twice to simply mean 'way' in a patently non-technical tense (OEP 204, 222, see also PPO 30)) and once interchangeably with 'motions' (OEP 177).

That is also how she uses it, once, the 1663 PPO: 'one and the same Inmate matter may Move in Different Modes or Manner of ways' (PPO 34).

So, matter can act in ways, but what Cavendish denies is that we must think of these ways as entities, half-entities, or distinct in any way from matter, including conceptually. Cavendish is working very hard, I think, to get us to stop thinking in terms of substance-property structure, and talk of modes, no matter how reductionist, keeps us thinking in terms of that structure.

To summarize: Cavendish denies the existence of all property-like entities. She does so for three principal reasons. First, such entities are not full-fledged entities. There is only one kind of entity, the entity of matter. Thus, Cavendish's view can be described as what Peter Van Inwagen has called a 'monocategorial ontology'and L.A. Paul has more recently called a 'one-category ontology'.[xxii] Second, accidents and the like are supposed to be distinct from the bearer in a special kind of way, that is not the way that one piece of matter is distinct from another piece of matter, and there are no such distinctions. Third, these entities are supposed to be related to matter in a special kind of way, which is not the way that two pieces of matter are related to one another, namely, as parts.

That this is the motivation for Cavendish's materialism, and not so much that she wants to tell us what kinds of substances there are, is hinted at by something that Cavendish writes, in her *Letters*, about Van Helmont's account of accidents:

> Truly, Madam, these accidents seem to me to be like…Dr *More's* Immaterial Substances or Daemons, onely in this Dr *More* hath the better, that his Immaterial Substances, are

> beings, which subsist of themselves, whereas accidents do not, but their existence is in other bodies; But what they call Accidents, are in my opinion nothing else but Corporeal Motions, and if these accidents be generated, they must needs be bodies, for how nothing can be Generated in nature, is not conceivable, and yet your Author denies, a that Accidents are something, namely some part of a natural thing...

Here, Cavendish rejects More's immaterial substances, and she rejects Van Helmont's accidents. But at least More posits that his immaterial substances fully exist. In contrast, the claim that something exists but only in something else is incoherent. Cavendish also reiterates, in this passage, her complaint that accidents are supposed to be 'in' things in a way that is not as a part in a whole. Moreover, with 'namely', she assimilates 'something' with being 'some part of a natural thing.'

How, then, does Cavendish explain qualitative variation? In Section 3, I'll argue that like the mechanists, Cavendish reduces many qualities to the actions of matter. In Section 4, I describe how Cavendish thinks that fundamental variety is generated. And in Section 5, I argue that the structure of matter is that of parthood and composition.

These three sections discuss Cavendish alongside some mechanical philosophers, for several reasons. She is in dialogue with them, and sometimes presents her own views as alternatives to theirs. Moreover, her claims often sound similar to the claims of Boyle and Hobbes, but this is misleading, because she understands words like 'motion' and 'figure' differently than they do. So contrasting her view with theirs can help us better understand her very unique system. So too can articulating it against the background of a much more familiar system.

3 REDUCIBLE QUALITIES

Like Cavendish, Hobbes, Bacon, Boyle, Descartes, and Galileo all reject Scholastic accounts of qualitative variety. The mechanical philosophy can be understood in part as an attempt to provide an alternative account of that variety. In *The Origine of Forms and Qualities,* for example, Boyle promises to provide a non-accident-based explanation of 'almost all sorts of qualities, most of which have been by the schools either left unexplained, or generally referred, to I know not what substantial forms' (Boyle, *Origine*, 3). Boyle's account of qualities is complex, and it differs in subtle and interesting ways from those of his contemporaries as do theirs from each others'. But it can serve as a representative to compare with Cavendish.

The mechanists account of many qualities is in terms of the effects that matter has on a perceiver (Boyle, *Origine*, 3; Hobbes, *De Corpore*, VIII(4)). Often Cavendish seems to account for qualitative variety in a way that is broadly analogous:

> But it is to be observed, that one object may have several properties, which are all not subject to the perception of one sense; as, for example, the smell of an odoriferous body, and its color, are not subject to the same sense…The truth is, it is as easy for several senses to pattern out the several proprieties of one body, as it is for several painters to draw the several parts of one figure; as for example, of a burning candle, one may draw the wax of tallow, another the wick, another the flame: The like for the perceptions of several senses: Sight may pattern out the figure and light of a candle; touch may pattern

> out its weight, hardness or smoothness; the nose may pattern out its smell; the ears may pattern out its sparkling noise, etc. (OEP 176-177).

More generally, Cavendish characterizes sense perceptions as the capacity to make partial perceptions of one and the same object, in the following way:

> The several perceptions do not make them to be several bodies, but they are patterned out or perceived as several proprieties or attributes of one body, or as several effects of one cause; for though there is but one cause in nature, which is self-moving matter; yet that only cause must of necessity have several effects or proprieties, as figure, colour, place, magnitude, etc. (OEP 193)

One and the same matter will have different effects on different matter; the effects that they have, which we call qualities or 'proprieties', vary based upon the structure of the perceiver.

This kind of theory cannot be fully understood without a corresponding theory of perception. A full account of Cavendishian perception is beyond the scope of this paper, but we can note its relevant outlines. Animal sense perception involves a sense organ moving its own matter into a figure that is a 'pattern' of the perceived object. This differs from the mechanists in two important ways.[xxiii] First, there is no mediation by a mechanical process. Second, since Cavendish is a materialist, perception does not involve any body-mind causation. The perception is simply a state of matter.

The result of these two differences is that it is much harder to see, for Cavendish, how a quality can be present in sense perceptions but not in the object that is perceived. When I see a buttercup

as yellow, that is a result of my eye 'patterning' something in the world. Cavendish herself seems to conclude on this basis that yellow is in the world, as are other sensible qualities like heat:

> Our optic sense could not perceive either the original, or copy of an exterior object, if it did not make those figures in its own parts: and therefore figure and color are both in the object, and the eye; and not, as they say, neither in the object, nor in the eye (OEP 147).
>
> [T]he heat we feel, is made by the perceptive motions of, and in our own parts…but yet, if the fire were not really such a thing as it is, that is, a hot and burning body, our sense would not so readily figure it out, as it does, which proves it is a real copy of a real object, and not a mere phantasm… (OEP 148)

This makes it difficult to understand how my perception of the buttercup's yellowness could be just some motions in my eye moving like some motions in the buttercup, unless by 'motions' Cavendish means something very different than do the mechanists.

I do think that Cavendish means something different by 'motions' than do the mechanists, as I will explain in Section 4. But I do not favor the view that the kinds of motions include simply being a certain phenomenal color, and that Cavendishian matter is fundamentally rich with qualities.[xxiv] Cavendish clearly gives 'corporeal figurative motion' a special status, reducing many qualities of bodies to them. She explicitly does so for color and heat, claiming that 'the brighter the colours are, the smoother and evener are the figurative motions' (G 213, see also 89 and 212) and that 'the corporeal, figurative, self-moving, perceptive, rational and sensitive parts of nature, which make all other creatures, make also heat and cold' (OEP 104), which are not principles but effects of motion (OEP 95).

The quality-realist passages are admittedly challenging but not impossible for the reductive account to explain. It is clear that Cavendish thinks that animal perceptions of qualities depend on the body of the perceiver, and that this affects how they are perceived, even to the point of misperception:

> It is true, that animals, by their perceptions may pattern out the heat or cold of the air, but these perceptions are not always regular or perfect; neither are the objects at all times exactly presented as they should, which may cause an obscurity both in art, and in particular sensitive perceptions; and through this variety, the same sort of creatures may have different perceptions of the same sorts of heat and cold (OEP 103).

We may also question how transparent Cavendish thinks the mind is to introspection. While color may be both in the object and the eye, it may not be in the eye exactly as we think it is.

4 MOTION AND SELF-MOTION

Both Cavendish and the mechanists hold that many qualities can be explained as the effects of bodies on our senses. The effects of bodies on our senses in turn depends on some structures in the perceived bodies themselves. In Section 5, I'll describe what those structures are, for Cavendish and for the mechanists. But in this section, I'd like to talk about the role of motion in generating those structures. Cavendish, Boyle, and Descartes all hold that matter without change would have no variety. According Boyle and Descartes, all the variety in matter arises from motion, and according to Cavendish, all the structure in matter arises from self-motion 'particular creatures and actions, are but effects of the only infinite self-moving matter' (OEP 141). Again,

this superficial similarity in their positions belies deeper differences. In this section, I'll describe how Cavendish thinks about the relationship between matter, variety, and self-motion, contrasting it with the mechanist view.

4.1 Self-motion vs. 'mechanick' motion

According to Boyle, matter is 'actually divided into Parts' as 'the genuine Effect of variously determin'd Motion' (Boyle, *Origine*, 4). But in addition to generating numerous parts, motion also generates qualitative variety, because it has the result that 'each of the primitive Fragments, or other distinct and entire Masses of Matter must have two Attributes, its own Magnitude, or rather Size, and its own Figure or Shape' (Boyle, *Origine*, 8). The 'mechanical affections' of shape and size, along with the local motions of shaped and sized particles, then serve in explanations of other qualities.

Cavendishian self-motion is not local motion. Peterman (2019) provides a detailed defense of this position, but this passage illustrates it:

> Though is be a vulgar phrase, that a man changes his place when he removes, yet it is not a proper philosophical expression; for he removes only from such parts, to such parts: so that it is a change, or a division and composition of parts, and not of place (OEP 37).

The suggestion here that motion involves composition and division is borne out in the rest of Cavendish's work, where she repeatedly assimilate change in general with compositions and divisions, and identifies composition and division as 'the chief and general action of nature.' So while Boyle and Descartes are left to explain exactly how relative motion in space generates

distinctions between parts, for Cavendish, it is obvious why self-motion does this job: it simply *is* composition and division. Moreover, Cavendish does not posit that in this process, the parts of matter gain any features, like the 'mechanical affections'.

There is another important distinction between the mechanist claim that motion generates variety and Cavendish's claim that self-motion generates variety. Boyle explicitly argues that because the 'Catholick or Universal Matter common to all Bodies' is 'in its own Nature but one,' he argues, 'the diversity we see in Bodies must necessarily arise from somewhat else, then the Matter they consist of' (Boyle *Origine* 3). Boyle concludes, as does Descartes, that this external source of diversity is motion.

According to Cavendish, in contrast, since only matter exists, the explanation of diversity cannot come from outside matter. Matter generates variety in itself; variety is not engendered in it by something superadded to it, by God or otherwise. When Cavendish writes that self-motion generates variety, what she means is that matter acts to variegate itself. Self-motions are the actions of matter that divide and compose itself into parts.

As she does of accidents and modes, Cavendish claims that the actions of matter are all one with matter, and that 'a man, and his actions, were no more different, than a man was different from himself' (OEP 37). However, this does not send matter sliding back into a Parmenidean purée. Unlike in the case of qualities, properties, and the like, Cavendish is happy to say that the *very same* matter can act differently at different times:

> No particular parts are bound to certain particular actions, no more than nature herself, which is self-moving matter; for, as nature is full of variety of motions or actions, so are her parts; or else she could not be said self-moving, if she were bound to certain actions, and had not liberty to move as she pleases (OEP 138-139, see also 37).

If the very same man can act in one way at one moment and in another way at another moment, doesn't that mean that there must be a distinction of *some* kind between a man and his actions? I think Cavendish's answer is simply: no. It is not clear that we need to think of actions as entity-like in any sense, and thus, the question of distinction does not arise. Matter is matter; its actions are what it does.

For this reason, Cavendish writes, targeting Boyle, that not only does motion not originate outside of matter, but 'there can no abstraction be made' of motion from matter.' Instead motion and matter are 'but one thing and inseparable' and 'make but one substance' (OEP 137).

In claiming that matter and self-motion are identical, Cavendish is left with two questions.

First: Cavendish holds that a world without self-motion is conceivable and possible. How can she hold this at the same time she holds that matter and self-motion are identical?

Second: To get diversity, matter needs to act diversely. That matter is self-moving tells us that matter acts, not how it acts, and in particular not how different parts of it act in different ways.

Cavendish sees and answers both of these questions. The answers require understanding the 'triumvirate' of matter, as I will explain in the next section.

4.2 The triumverate and change

Cavendish holds that matter comes in three 'degrees': inanimate, sensitive, and rational. Sensitive and rational matter have self-motion, while inanimate matter does not. For now, we can treat sensitive and rational matter as simply self-moving matter; Section 5.3 argues that this is in fact all they are. Cavendish calls these the 'constitutive parts' of nature, because they constitute matter, as opposed to the effective parts of nature, which are the effects of the motion of matter so constituted.

At the same time that Cavendish distinguishes between these, she claims that they are so completely mixed together that we should treat nature, and every part of matter, as one self-moving body (OEP 16, 28, 33). She is drawing here on the concept of a perfect mixture that can be found in Aristotle, the Stoics, and chemical philosophy, according to which a mixture of several substances yields a new, homogenous substance from which the components cannot be extracted, whose nature is not reducible to parts with the natures of its components. While the resultant mixture can be treated as homogeneous, is it not basic. To use the terminology of the chemical philosophy which Cavendish sometimes adopts, a principle or element of nature, because its nature is ultimately grounded in and explained by the natures of the components (OEP 236). And so too are the actions of matter: 'the Triumphant Parts cannot be perceived

distinctly asunder, though their Actions may be different: for, the joining, or intermixing of Parts, hinders not the several Actions' (G 10).

Why does Cavendish think the triumvirate is necessary to explain the behavior of self-moving matter? The answer is that the triumvirate is necessary because Cavendish does not think that the power to cause natural change in itself, as we understand it, can be a principle. There are two reasons for this, corresponding to the two questions above: the first concerns the nature of change in general, and the second concerns the diversity of natural changes. Cavendish alludes to both here:

> This triumvirate of the degrees of matter, said they, is so necessary to balance and poise nature's actions, that otherwise the creatures which nature produces, would all be produced alike, and in an instant (OEP 25-26).

The first reason that the triumvirate is necessary is that Cavendish thinks that natural change involves a balance between two principles: an entirely active principle and an entirely passive principle. If nature were all inanimate matter - the passive principle - there would be no change because, obviously, there is nothing to cause change. What is more, since time depends on change, it would not be in time. In the Argumental Discourse above, Cavendish has given herself the tougher challenge of explaining why nature cannot be made entirely of animate matter, the active principle. Her answer is that in that case, all change would happen in an instant - and since it would all happen in an instant, there is presumably no time that version of nature, either. So, the fact that there is change over time, and indeed time at all, depends upon the mixture of these two principles.[xxv]

The second justification that Cavendish gives for the triumvirate is that without it there would be no diversity of creatures: if all matter were inanimate, there would be no creatures at all, and if all matter were animate, all creatures would be produced alike. The idea here seems to be that different parts of nature act differently, particular in respect to their 'degrees of motion', viz., slowness and quickness. This difference cannot be left unanalyzed, because: 'the slowest motion was as much motion as the quickest' (OEP 25). Differences is speeds are not deep differences; the only deep difference is between non-motion and motion. So different kinds of motions must result from a blending of these.[xxvi]

These go some way towards addressing the two questions above. First, Cavendish does claim that a perfectly inanimate world is a possible one. But it would not be a world of matter devoid of motion, waiting to be enlivened. If God made that world and then changed his mind, he'd have to create a new one with animate matter in it. This much is clear from Cavendish's claim that

> It is not Motion which is the cause of Animate Matter, but Animate Matter is the cause of Motion, for were there no such Matter, there would not be any Motion, for Motion is but the Effect, not the Cause (PPO 25).

And of three degrees, Cavendish writes: 'The nature of each must remain as it is; or else if it could be thus, then the animate part might become inanimate, and the rational, the sensitive, etc. which is impossible' (OEP 26).[xxvii]

An objection still looms. Cavendish admits that it is divisible stuff, although it is not divided. As I'll argue in the Section 5, this is just what matter is. So the inanimate world *is* just unenlivened matter, after all. If that is right, Cavendish cannot maintain that self-motion cannot be distinguished from matter. I'll address this objection in Section 5.3.

In the meantime, the triumvirate does not give us a reason to think of matter as having particular qualities or capacities. In fact, it further confirms that Cavendish is trying to do away with quality-talk entirely. Her claim that the diversified capacities of matter to act is a result of mixture is her attempt to avoid talking about a bit of matter losing, gaining, or changing speed. She suggests as much here:

> Animate matter, was nothing else but corporeal self-motion; and if any difference could be apprehended, it was … between these two degrees, to wit, the animate and inanimate parts of matter, and not between the animate part, and self-motion, which was but one thing, and could not so much as be conceived differently (OEP 35).

5 FUNDAMENTAL STRUCTURE IS PARTHOOD STRUCTURE

This section argues that matter is divisible stuff and that synchronic metaphysical structure is reducible to parthood and composition. In the first section, I argue that matter is essentially stuff, and in the second section that it is essentially divisible. In the third section, I argue that nothing else belongs to the essence of matter or is superadded to it.

5.1 Matter, and only matter, is stuff

Cavendish does not just think that nothing but matter happens to show up in our world; rather, she thinks that materialism is necessarily true, or something close to necessarily true. This she shares with Hobbes, who also held that incorporeal substance was impossible; however, their reasons for holding it are different.

Both think that the concept of an immaterial substance is incoherent. Both also hold that 'matter' (or 'body', which is Hobbes's preferred term) and 'substance' are synonymous. Hobbes, however, defines body in terms of spatial extension. Given that almost no philosopher will allow that 'substance' is defined in terms of spatial extension, Hobbes needs to say more. What he says is that it is impossible to conceive of a substance that does not occupy space, which in turn relies on the contentious claim, which Hobbes justifies by introspection, that all ideas are images and all images are extended.

Cavendish, too, holds that 'it is impossible…to conceive a natural immaterial substance' (OEP 86, see also OEP 75, 89,193). She occasionally uses this to dismiss claims that other philosophers make about immaterial things (e.g. G 4). But her main argument for materialism does not rely on the inconceivability of immaterial things - nor does her argument for the inconceivability of material things depend upon introspection. Instead, she argues from materialism to inconceivability, as follows. Our minds are matter. Ideas are the creations of our minds, and matter can only beget matter. And our ideas put us in relationship to external things,

all of which are matter, and matter cannot be in a relation, causal or otherwise, with anything immaterial (PL 3.2, 2.32). So for all these reasons, our minds cannot have ideas of immaterials.

How, then, does Cavendish argue for materialism? I don't think there is much of an argument for it: Cavendish really does take 'matter' to mean something like 'substance', using the terms 'matter' and 'substance' interchangeably (OEP 36, 126, 134). So the phrase 'immaterial substance'' is contradictory. It is easier for her to hold this than it is for Hobbes because she does not stipulate that matter is extended in space, or is any specific kind of substance at all.

It will be argued that this cannot be right, because that while Cavendish clearly holds that there are no immaterial substances *in nature*, she allows that there is at least one immaterial substance, God, outside of nature. For example, Duncan asserts that Cavendish's 'general position is clear. There are immaterial substances, which are not a part of nature' (Duncan, *Materialism,* 88-89). However, while Cavendish does describe God as immaterial and call God 'an Immaterial', she never once claims that God is an immaterial *substance*, nor does she claim that an immaterial substance exists outside nature. The first question she asks in the Appendix to the *Grounds*, after laying out her system of matter, is 'Whether there can be a Substance, that is not a Body' and whether 'there may be a Substance, that is not a Natural Substance; but, some sort of Substance that is far more pure than the purest Natural Substance.' The answer is no, for the reason that it would have to be divisible, and all divisible substance is a body:

> I answer: Were it never so pure, it would be in the List or Circle of Body: and certainly, the purest Substance, must have the Properties of Body, as, to be divisible, and capable to be united and compounded; and being divisible and compoundable (G 238).

Nothing here or in the rest of the passage suggests that this argument only applies to natural things. The next section of that appendix is titled 'Of an Immaterial.' The word ‘substance’ does not appear; the topic has changed. This section establishes that there are no immaterials in nature, and that there is only one possible immaterial outside of nature, God, because an immaterial must be uncreated and only God can be uncreated. When Cavendish is considering immaterials at all favorably or even agnostically, she never uses the phrase 'Immaterial Substance.' She calls them, most often, simply 'Immaterials', and occasionally 'Immaterial Things' or 'Immaterial Beings'.

What is 'an Immaterial' if not an immaterial substance? I don’t know, and neither does Cavendish, as she very openly admits. We cannot conceive them, they would be entirely disconnected from nature, they are not a legitimate subject of natural philosophy (OEP 230, 239, PPO 8).[xxviii]

What is behind Cavendish’s identification of matter with substance? Matter has three main features that are central components of the concept of substance as she would have understood it: matter is independent being, matter cannot be naturally created or destroyed, and matter is what persists through change.

But, as I’ve argued, Cavendish rejects the sense of substance on which it is a substratum in which properties can inhere. And she rejects any account of change in terms of a substance losing or gaining inherent entities. Other conceptions of substance that are not central to her account of matter include identity over time, about which she takes a fairly Heraclitean view, and

unity, her account of which is too complex to do justice to here, but which does not, I believe, appeal in any straightforward way to the notion of substance. So we should be careful how much of the more familiar features of substance we should project onto Cavendishian matter.[xxix]

We should call matter what Cavendish calls it, and investigate what it is like on her terms. But a contemporary touchstone, which is more useful for understanding Cavendishian matter than is substance, is 'stuff,' which, like 'matter', is a mass noun.[xxx] In an article about the metaphysics of mass expressions, Mark Steen identifies matter as a stuff-kind and that 'stuff' is more general than matter, arguing that 'if it wasn't, it is hard to see how scientists could speak, as they do, about universal properties of matter, or what kinds of matter there are, or how philosophers could contrast matter with allegedly non-physical minds, abstract objects, and so forth.'[xxxi] This is precisely what I am arguing that Cavendish *denies*: matter is not a kind term, and she doesn't think that scientists should be speaking about any of those things. Cavendishian matter is just stuff.

5.2 Matter is divisible

At this point it is truly impossible to characterize the mechanist position in any interesting way; there is too much diversity among them regarding what, exactly, fundamental structure is and how, exactly it is generated. But for many mechanists, local motion generates parts with what Boyle calls the 'mechanical affections', Descartes calls the 'modes of extension', and Galileo calls 'primary and real properties'. The individual lists differ, but geometrical properties like shape and size are central.

What makes shape, size, and local motion special, for the mechanical philosophers? And why are not these so many accidents that should be banished like heat and color? This is far too complicated a question to give anything other than a glib answer here. But I think it is fair to say that the mechanical philosophers saw themselves as taking advantage of the structure of space to talk about fundamental structure without inviting talk about losing and gaining qualities. A bit of matter can change its location or its speed (the thought goes) without changing any of its intrinsic qualities. We may be left with questions about the relationship between space and spatial structure: for example, is space entirely relational? Does spatial structure inhere in space? But compared to the Scholastic story, it was felt to be a leap forward in intelligibility.

Given Cavendish's appeals to 'motion', 'figure', 'place', and 'magnitude' in many fundamental explanations of natural phenomena, it is natural to think that she follows the mechanists in embracing the special status of spatial notions. However, it turns out that what she means by these terms is very different from both what the mechanical philosophers meant by them.

I cannot give a full account of the evidence for this here, but I'll briefly outline the arguments that local motion, shape, and size do not have the significance, for Cavendish, that they do for the mechanical philosophers.

First, it is very clear that motion is not local motion, for Cavendish. So spatial structure does not play any role in explaining fundamental change. This already strongly suggests that fundamental structure, for Cavendish, is not spatial structure: fundamental change, after all, should be change

in fundamental structure. A (perhaps painfully) detailed argument for this can be found in Peterman (2019).

Second, the size of a body does not seem to be of much interest to Cavendish. She never uses size to play explanatory roles; the distinction between finite and infinite is important in her system, but she does not seem to think that relative size variation is important. More importantly, she reduces magnitude to composition facts, describing magnitude as 'nothing else but the effects of self-moving matter, made by a composition of parts, and cannot be attributed to one single part' (OEP 30).

Third: 'figure' plays an important role in explanations, for Cavendish, and appears in the all-important phrase 'corporeal figurative motions'. Coming from the pen of a mechanical philosopher, this would mean geometrical figure or shape. But it does not appear that this is Cavendish's meaning. 'Figure' usually seems to signify something much more general: the basic nature of a thing, at least in a particular moment. It's hard to argue for this because the word 'figure' is so often used, but it is significant that none of it, in the relevant contexts, is specific to geometrical figure. And just like for local motion and magnitude, Cavendish often seems to use 'figure' to refer to compositional structure; for example: 'Production is only a society of particular parts, that join into particular figures…but as parts produce figures, by association; so they dissolve those figures by division' (OEP 78, see also OEP 55, OEP 139 and G 17).

Finally, Cavendish seems to give no special status to extension, in general. Most of the time that she uses the word 'extension', it is synonymous with 'dilation', and describes an action to be

contrasted with contractions. 'Contraction and extension,' in turn, are 'the effects of parts, and magnitude and place are the effects of contraction and extension; and all these are the effects of corporeal figurative self-motion' (OEP 47). Cavendish is not alone in taking parthood to be more fundamental than extension. There is a good Aristotelian pedigree for this, and as Laura Georgescu's work details, Kenelm Digby, who was a close acquaintance of Cavendish's, held this kind of view.

All of this suggests that in place of the spatial structure of the mechanists, Cavendish puts compositional structure. Interestingly, mechanical explanations often relied on both kinds of structure, and from that perspective, Cavendish's system is more parsimonious. The rest of this section argues for the view that parthood and composition are fundamental structure, for Cavendish.

According to Cavendish, matter, and only matter, is divisible:

> Matter cannot be without parts (G B65, see also OEP 137).
>
> Nothing has parts, but what is corporeal, or has a body (G 45).

The depth of her commitment to both the necessity and the sufficiency claim is evident from many of her arguments. She argues both from the materiality of things to their divisibility, as well as from the divisibility of things to their materiality. Perhaps the most striking examples of the second are arguments that appeal to the manifest divisibility of the mind to establish that it is material (e.g. G 89).

That matter cannot be without parts was a fairly commonplace commitment; that only matter is divisible was not, and deserves further comment.

In her reply to Hobbes about the bloody cloth, one reason that Cavendish gives for rejecting accidents and the like is that they are supposed to be distinct from matter in a way that is not as two parts are distinct, and related to matter in a way that is not the way that two bits of matter are related to one another. This reflects not just Hobbes's view, but also, for example, Descartes's, who holds that a mode is not part of a substance because 'a body is a substance, and a mode cannot be a part of a substance' (Descartes *Sixth Replies* / CSM II 292).

As we have already seen, Cavendish simply rejects the coherence of this view. All distinctions between things that exist are parthood distinctions, and distinct things that exist are related only by composition' 'as there are infinite changes, compositions, and divisions in nature' Cavendish writes, 'so there must be of parts; *there being no variety but of parts*' (OEP 18, my italics). Among the arguments in which this is implicit is Cavendish's argument against atomism. Cavendish argues that atoms, if they were, as stipulated, 'not parts of the body of Nature', would be as two separate worlds and so no order among them would be possible (OEP 67). The implication is that no relations are possible among things that are not related to one another as parts of a whole.

What's so special about parthood, that it gets to be the only distinction, and composition, that it gets to be the only relation?[xxxii] A complete treatment of all of the details of Cavendish's account of parthood and composition is impossible to provide in this paper, but here, I think, is the idea.

We've seen that Cavendish denies essential dependence: there is one kind of being, not a hierarchy of beings. So the distinctions and relations that there are between beings should be possible only between things with the same sort of being. When two things are parts of a composition, the things and the composition are the same kinds of things, and when we divide up a piece of matter (unlike, say, a substance), we have two bits of matter. To use an idiom coined by Tyler Burge in contemporary discussions of stuff, Cavendishian matter is cumulative and dissective[xxxiii]: when you put together matter you get matter, and when you divide matter up you get matter.

This is why we should not take the claim that matter is divisible stuff as specifying a species of stuff. According to Cavendish, this is just how being behaves; parthood and composition is just part of a stuff ontology. The division between parts is just the kind of distinction that is appropriate to matter like this, while composition is how two bits of matter or stuff come to be related to one another. All of this suggests that Cavendish takes basic metaphysical structure to be parthood and composition. Remember, too, that Cavendish takes composition and division, and not local motion, to be the 'chief and fundamental actions of nature.' So it shouldn't be too surprising that fundamental structure is compositional and not spatial.

While Cavendish almost never uses the term 'essence', she is happy to talk about the 'natures' of things. So the nature of matter may not unreasonably be identified as divisible stuff. Some things that Cavendish says suggests that matter has further features, either necessarily or contingently. As a result, most readers of Cavendish hold that matter, as it must be or as we find it, is something more than just divisible stuff. In the next section, I offer some brief replies to this.

5.3 That is all that matter is

In this section, I consider four more features of matter that might be said to specify what matter is beyond it's just being stuff that is divisible. There are four candidates for that: self-knowledge, sense, reason, and self-motion.

Cavendish tells us that all matter, including inanimate matter, is 'self-knowing.' Some of what she writes about matter's self-knowledge makes it sound something like an essential, intrinsic property of matter (e.g. OEP 163), and it has been read that way by many of her contemporary readers.[xxxiv] Most of those readers see it as a kind of psychic or protopsychic principle that Cavendish posits as necessary to ground the natural order in general as well as the knowledges and perceptions of composed creatures.[xxxv]

Self-knowledge is not, however, a psychic or protopsychic principle, nor is it anything like a property of matter that would expand the definition of matter as divisible stuff. That is because while it is certainly true of matter, according to Cavendish, that it is self-knowing, self-knowledge is contained in the definition of matter as divisible stuff. Much of what Cavendish writes about self-knowledge makes it sound like identity; for example, she writes that 'self-knowledge…cannot be divided from its own nature' just as 'matter cannot be divided from being matter' (OEP 163). In the counterfactual case that there were no self-motion and as a result no metaphysical structure, to say that matter is self-knowing is simply to say that it is self-identical.

In a world with parthood and composition, however, self-knowledge, precisely by being the principle of identity, also serves as the principle of composition: it is what identifies some parts with one single composite thing. For Cavendish, composition is identity, namely, the identity of some parts with one thing: 'a whole and its parts', she writes, are 'yet are one and the same thing, several ways' (OEP 193), and 'a whole is nothing but a composition of parts, and parts are nothing but a division of the whole' (G 158). So, to say that matter is self-knowing is just to say that it is self-identical and structured by parthood and composition. Peterman (forthcoming) gives further arguments that we should not think of self-knowledge as a mentalistic capacity that matter has, and Georgescu (2021) defends a similar view of self-knowledge.[xxxvi]

Moving on to sense and reason. Cavendish tells us that there are two kinds or degrees of animate matter: sensitive matter and rational matter. This makes it sound like sensitive and rational matter must each have some other feature to distinguish them from each other. However, this is not the case. Cavendish in fact makes quite clear that self-motion "makes the only difference between animate and inanimate matter" (OEP 192). She frequently writes that there are just two kinds of matter, animate and inanimate: 'as for matter itself, there are no more degrees but animate and inanimate; that is, a self-moving, active, and perceptive, and a dull, passive and moved degree'(OEP 30, see also 201). And she often identifies sense and reason with self-motion ('Sense and Reason, which is self-motion' (PL 1.10)).

What, then, is the difference between sensitive and rational matter? It is very clear from Cavendish's derivation of the triumvirate at the beginning of the Grounds, where she argues that there are

> two sorts of Matter, namely, that sort which is Self-moving, and that which is not Self-Moving. Also, there can be but two sorts of the Self-Moving Parts; as, that sort that moves intirely without Burden, and that sort that moves with the Burdens of those Parts that are not Self-moving: So that there can be but these three sorts; Those parts that are not moving, those that move free, and those that move with those parts that are not moving of themselves: Which degrees are (in my opinion) the Rational Parts, the Sensitive Parts, and the Inanimate Parts (G 66).

The difference between sensitive and rational matter is just how burdened they are by inanimate matter.

That leaves only the relationship between matter and self-motion, and the question that was raised at the end of Section 4.2. Should self-motion be understood as part of the essence of matter, or as something superadded to matter?

It is clear that Cavendish takes matter to be self-moving, and that this fact is irreducible to any other facts. She also claims that self-motion is one and the same with matter, which should be unsurprising: self-motion is simply matter's potential to act or change itself, and Cavendish identifies matter with its actions, too. Considering all this, it is natural to think that self-motion must be essential to matter.

On the other hand, Cavendish says about self-motion what she says about actions: it is possible for the very same matter to move itself differently at different times. That is grounded in the fact that matter is actually a mixture of animate and inanimate matter, which is in turn related to the

fact that a world of inanimate matter is possible. This makes it sound like matter is conceivable without self-motion, and so self-motion must be something 'superadded' to matter and in some sense distinct from it, even if only conceptually.

I think that this is precisely the kind of paralogism that Cavendish is trying to help us escape with her critique of substance-property structure. Self-motion is not something essential to matter, but neither is it something superadded. Self-motion is not 'something' at all.

Self-motion is simply the fact of change: to say that matter is self-moving is to say that we live in a world of change. Cavendish appreciates how fundamental a fact this is. This is clear from the beginning of the *Grounds*, where she argues on an a priori basis that if we are looking for deep distinctions in matter, only one is possible: the one between inanimate and animate matter.

Moreover, as we have seen, a world without the particular balance of inanimate and animate matter would not have any structure at all: there would be no time, so no diachronic structure, and no variety, or synchronic structure, since self-motion is required to cause actual dividings and composings. So while there are possible worlds where the three kinds of matter are not mixed, they are entirely unrecognizable; arguably they would not count, for Cavendish, as possible *nature* at all. This goes some way toward explaining why Cavendish, even while acknowledging that a world with only one kind of matter is possible, also writes that 'it is impossible that those three sorts of Parts should subsist single' (G 3).

In sum: it is true that for Cavendish, matter has structure, and it undergoes change. But there is no reason, according to Cavendish, to impose inherence structure on these very basic facts about nature. It is perverse to think of structure and change as properties, qualities, modes, features, or any*thing* at all distinct from matter itself.

6 CONCLUSION

Cavendish's claim that there is only matter is not a claim about the kinds of substances there are and are not, and the kinds of properties this substances have. It is precisely a denial that there are substances and properties at all. Instead, with her materialism, Cavendish proposes a radically non-hierarchical picture of the world: there is only being of one kind. And she proposes that the way that this stuff is structured is as compositions of parts. This is a kind of structure that, she thinks, allows her to have an even more parsimonious picture of reality than do the mechanists who were her contemporaries.

Cavendish has what Michael Della Rocca might call a Parmenidean spirit: her allergy to distinctions drives her to deny almost every distinction that there is.[xxxvii] In the end, however, Cavendish cannot deny the fact of variety, and so she posits one kind of distinction: the distinction between parts.

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[i] [Acknowledgements removed for review.].
[ii] O'Neill, *Observations*, xxiii. See also Duncan 2022 80-84.
[iii] E.g. Descartes *Meditations* / CSM II 48.

[iv] As cited in Wolfe, Charles. *Materialism: A Historico-Philosophical Introduction*. Dordrecht: Springer: 2016. 'Materialism' wasn't a widely-used term until the end of the 17th century, where it appeared primarily as an ill-defined term of abuse and run together with similarly ill-defined polemical terms like 'mechanism', 'Spinozism', 'necessitarianism', 'atheism', and 'Epicureanism'. It became increasingly common in the 18th and 19th centuries but was still extremely polysemous.

[v] Cavendish holds that matter is in fact a perfect mixture of three 'degrees' of matter, one of which is inanimate. This may seem like a counterexample to the claim that all motion is self-caused. I argue in Section 4 that it is not.

[vi] Wolfe, *Materialism*, 804.

[vii] Julia Borscherding, 'A Most Subtle Matter: Cavendish's and Conway's (Im)Materialism' ['Subtle'] Joshua R. Farris and Benedikt Paul Göcke, eds. *The Routledge Handbook of Idealism and Immaterialism*. 2021.

[viii] Karen Detlefsen, 'Reason and Freedom: Margaret Cavendish on the Order and Disorder of Nature ' [Reason] Archiv für Geschichte der Philosophie 89 (2007): 157-191.

[ix] Shaheen, unpublished.

[x] Cavendish allegedly 'holds that some matter is fundamentally and irreducibly thinking' (Duncan 2022, 76), endorses 'a form of panpsychism in the strong sense that every part of nature contains the same rational principle as humans' (Shaheen 'Thrice', 636), holds that 'bodies [are] intelligent and thoughtful from the start' and that 'mentality is already among their immediate properties' (Cunning *Cavendish*, 73).

[xi] E.g. Duncan describes it as a modification of Hobbesian materialism, or as 'materialism, with thinking everywhere' (Duncan *Materialism* 76).

[xii] Strawson, Borscherding, 'Subtle'; David Cunning, *Arguments of the Philosophers: Cavendish* [Cavendish] (New York: Routledge, 2016).

[xiii] Daniel Stoljar, 'Physicalism', The Stanford Encyclopedia of Philosophy. There are other characterizations of physicalism on offer, but even those don't explicitly reject property talk; it just isn't

front and center. See Alyssa Ney, 'Physicalism as an attitude.' Philosophical Studies 138(1) (2008): 1-15; Janice Dowell. 'Formulating the thesis of physicalism: An introduction.' Philosophical Studies 131(1) (2006): 1-23.

[xiv] Jan Baptista Van Helmont, *A Ternary of Paradoxes* (London: William Lee, 1650). For a detailed genealogy of accidents, see Robert Pasnau, *Metaphysical Theme*s [*Metaphysical Themes*] 1274-1671 (Oxford: Oxford University Press, 2011).

[xv] Hobbes, of course, is wrong that everyone understands how this is to be understood.

[xvi] It is not true that Hobbes thinks that color is separable from a colored body, or can be transferred from one to another, although Hobbes does think that a body can gain and lose accidents, except magnitude, in a change (Hobbes, *De Corpore*, 8.21)

[xvii] Stanley, *History*, 388.

[xviii] O'Neill, OEP, xiv-xv, xxi-xxii.

[xix] John Duns Scotus, *Ordinatio* (1300-1304). IV.12. As cited and translated in Pasnau, *Metaphysical Themes*, 196.

[xx] See also PL 3.2, 2.32.

[xxi] Descartes, *Second Replies* / CSM II 109; Robert Boyle, *The Origine of Forms and Qualitie*s [*Origine*] (Oxford: H. Hall, 1666), 35.

[xxii] Peter Van Inwagen, *Material Beings* (Ithaca: Cornell University Press: 1990); L.A. Paul, 'A One Category Ontology.' In John A Keller (ed.), *Being, Freedom, and Method: Themes from the Philosophy of Peter van Inwagen*. Oxford: Oxford University Press (2020). Paul's ontology has a lot in common with Cavendish's, and would have more in common with it if Cavendish accepted the view described in 2.2, that accidents are matter distinct from their bearers. Paul argues that the relationship between an object and its qualities is composition.

[xxiii] For a detailed account of Cavendish's theory of perception as it relates to the mechanist theory, see Adams.

[xxiv] This kind of account is defended by Colin Chamberlain, 'Color in a Material World: Margaret Cavendish against the Early Modern Mechanists.' *The Philosophical Review* 128(3) (2019): 293-336.

[xxv] We might wonder whether Cavendish is consistent in treating matter as one but also composed of animate and inanimate matter. The same question will arise a bit later for Leibniz, who shares Cavendish's syncretic spirit: how can a monad be a perfect unity and yet contain an active and a passive principle?

[xxvi] Motions can differ from one another for Cavendish other than in their quickness, although not with respect to determination as in the systems of Boyle, Descartes, and Hobbes, since motion for Cavendish is not local motion.

[xxvii] The three mixing to form the matter of our Nature is not the same as one degree becoming another degree. But Cavendish's claim that 'each must remain as it is' may seem to contradict the claim that nature is a perfect mixture. It is not true, though, that the natures of the degrees are lost in the mixture. That may seem a bit paradoxical, but that is precisely the paradox that a perfect mixture is supposed to embody. [The answer to 'are they still there or are they not there' is 'they are there but they are mixed.']

[xxviii] She also occasionally allows that humans have immaterial souls, distinct from our material minds and outside of nature. But these, too, are the concern of theologians and not natural philosophers. DUNCAN CITE PL 209-210

[xxix] Shaheen (unpublished) carefully and interestingly argues that there are several senses of 'substance' at work in Cavendish's metaphysics. One refers to the kind of stuff I've described here, and another is a 'type monist ontology recognizing infinitely many substances' (Shaheen unpublished 100).

[xxx] Shaheen also makes this point in (unpublished).

[xxxi] https://plato.stanford.edu/entries/metaphysics-massexpress/

[xxxii] I do not actually think that composition is a relation, in any sense that would imply the existence of property-like entities. I prefer to say that there are 'composition facts', but I call it a relation here to highlight that Cavendish wants it to do the work that relations do.

[xxxiii] Burge.

[xxxiv] E.g. Deborah Boyle, *The Well-Ordered Universe* (Oxford: Oxford University Press, 2017).; Detlefsen, 'Reason'.
[xxxv] See, for example, Michaelian 2009, Shaheen 2022, Cunning, *Cavendish*.
[xxxvi] Laura Georgescu, ''Self-knowledge', 'perception', and Margaret Cavendish's metaphysics of the individual. '*Early Modern Science and Medicine* 25(6): 618-639 (2021).

[xxxvii] Michael Della Rocca, *The Parmenidean Ascent* (Oxford: Oxford University Press, 2020).