"Cavendish and Hobbes on Causation"
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Introduction

This chapter examines the connections between Hobbes's and Cavendish's accounts of causation. Eileen O'Neill and Marcus Adams have argued that Hobbes and Cavendish share the same notion of entire causes as necessary and sufficient for producing their effects. While this account is well-suited to Hobbes's mechanical account of causation, O'Neill worries that this claim collapses Cavendish's account of occasional causation into full on occasionalism. I argue that a close analysis of Cavendish's views on the role of external objects in perception shows that it does make a causal contribution that is not merely moral. Karen Detlefsen has argued that Cavendish's account causation requires libertarian freedom and the denial of nature as a principal cause. This would put Cavendish at odds with both Hobbes's account of causes and his account of freedom. I argue that Cavendish's occasional causation only requires self-motion, that self-motion does not require libertarian freedom, and that matter is the principal or entire cause of all the effects in nature. This not only goes a long way in reconciling Cavendish's views with those of Hobbes, but also provides a more natural reading of her texts.

Natural Philosophy and Causation

The study of natural philosophy was of central concern to both Cavendish and Hobbes. Both philosophers thought that philosophy consisted in determining the causes of natural effects. For instance, Cavendish write that "natural philosophy is no more but a rational inquisition into the causes of natural effects" (2001, 158). Hobbes too thought that we used reason in order to ascertain the causes from their effects. In *De corpore*, he defines philosophy as follows:

> Philosophy is such knowledge of effects or appearances, as we acquire by true ratiocination from the knowledge we have first of their causes or generation: And again, of such causes or generations as may be from knowing first their effects (EW I.3).

Both Cavendish and Hobbes have wholly materialistic conceptions of nature and so they both agree that the subject of natural philosophy is bodies in motion. Given that the knowledge of causes and their effects is the aim of philosophy for both Cavendish and Hobbes, it makes sense that they both would provide an analysis of the relationship of causes and effects. This chapter will analyze Cavendish's views on causation while pointing out similarities and differences between her views and those of Hobbes. We know that Cavendish was familiar with Hobbes's views from reading the English versions of *De corpore* and *Leviathan* in addition to the fact that he was a frequent guest in the Cavendish household.[1]

[1] Cavendish claimed that she never spoke more than twenty words to Hobbes, but his influence on her philosophy is widely recognized. For more on the relationship between Hobbes and the Cavendish family, see Hutton (1999) and Whitaker (2002).

When it comes to Cavendish's views on the nature of causation, there has been a fair amount of discussion in the secondary literature. For instance, both Eileen O'Neill and Marcus Adams claim that Cavendish, like Hobbes, holds that all causes must be "entire causes," that is all causes are necessary and sufficient for their effects (O'Neill 2001 xxxiii; Adams 2016, 196). In addition, O'Neill goes on to claim that in the case of perception, where Cavendish holds an occasionalist account, the external object is merely a "moral cause" while the perceiver is the "principal cause" of the perception (2001, xxiii). Likewise, Karen Detlefsen has also argued that in the case of perception the external object is a mere moral cause (2006, 15-19). Detlefsen argues that not only are perceiving individuals the principal cause of their own perceptions, but that individuals within nature are the only principal causes; thus, she denies that nature as a whole is a principal cause. Here, I will examine the claims in the secondary literature and point out some of the tensions that arise. I will argue that the distinction between patterning and figuring can mitigate some of the issues, and show that Cavendish holds that matter, or self-moving matter, is the only prime or principal cause in nature. This will lead to a new understanding of Cavendish's system, which has consequences for her views on freedom. I begin with a brief overview of Cavendish's general views on causation.

Cavendish holds that there are two distinct types of causation. The first is what we might call "substance transfer" and the second type is occasional causation. Like Hobbes, Cavendish holds that causation involves change in a body's motions. So, for instance in substance transfer, Cavendish holds that a part of one body will divide from that body and compose with another body, as happens during digestion, generation, and respiration.[2] According to Cavendish, motion can be transferred this way because the motion moves with the matter. So, for instance, when a child is conceived, matter from both the parents, along with the motions that cause human development, are transferred into the mother's womb. Substance transfer can also happen by impact or the force of one body upon another, but it is important to remember that Cavendish maintains if motion transfers from one body to another body matter must also be transferred because motion is not separable from matter. For Cavendish, this type of causation is an instance of the composition and division of parts, which occurs whenever a body grows or decays and does involve contact between bodies. In positing substance transfer, Cavendish seems depart from Hobbes. She discusses Hobbes's example from De corpore:

> *[Hobbes says]that, when the hand, being moved, moveth the pen, the motion doth not go out of the hand into the pen, for so the writing might be continued, though the hand stood still, but a new motion is generated in the pen, and is the pens motion*: I am of his opinion, that the motion doth not go out of the hand into the pen, and that the motion of the pen, is the pens own motion (Cavendish 1664, 54; Hobbes *DCo* VIII.21; EW I.117; OL I.104).

That Cavendish agrees with Hobbes that the motion is not transferred from the hand to the pen might make one think she does not have a substance transfer view. But as I have emphasized, her account of the transfer of motion is really the transfer of moving *matter* from one body to another and this only occurs in the sorts of cases I mention above. In the passage just cited, Cavendish agrees with Hobbes that the motion from the hand does not transfer to the pen

[2] As Eileen O'Neill points out "Cavendish insists that transeunt causation takes place all the time in animal generation and the varieties of 'respiration'" (2001, xxxv).

because she sees this as an instance of her second type of causation.[3] This second sort of causation—occasional causation—is due to the self-moving nature of composed bodies and does not involve the transfer of matter and motion nor does it require contact between bodies. Cavendish provides an example in which a hand moves a string or ball. She writes,

> Therefore when a man moves a string, or tosses a ball, the string or ball is no more sensible of the motion of the hand, than the hand is of the motion of the string or ball; but the hand is only an occasion that the string or ball moves thus or thus. I will not say, but that it may have some perception of the hand, according to the nature of its own figure; but it does not move by the hand's motion, but by its own: for, there can be no motion imparted, without matter or substance (2001, 140).

In occasional causation, one object serves as the occasion for another object to move via its own self-motion in reaction to the first object. Of course, this is just a general statement of how it works – exactly what the exterior object does to trigger the self-motion of the other object is what is crucial for an understanding of her account. It is true that in the case of the hand and ball, the ball moves by its own self-motion. But as Eileen O'Neill has pointed out, if the external object, the hand in this case, plays no role in the causal process, how is Cavendish not committed to full occasionalism? Hobbes might have a similar problem. In his denial of motion transfer, he argues that when a hand moves a pen, the hand does not transfer its motion to the pen, "but that one accident perisheth, and another is generated" Hobbes *DCo* VIII.21; EW I.117; OL I.104). But what does the hand do to cause the generation of a new accident in the pen? Since Hobbes denies self-motion, it seems he has no answer to this question.[4] But as we will see, Cavendish, in subscribing to both self-motion and Hobbes's account of entire causes can provide a more satisfactory account.[5]

Entire or Principle Causes

As noted above, commentators have already shown that Cavendish accepts Hobbes's account of "entire causes."[6] In *De corpore* IX.3, Hobbes writes

> But a cause simply, or an entire cause, is the aggregate of all the accidents both of the agents how many soever they be, and of the patient, put together; which when they are all

[3] Cavendish's criticisms of Hobbes in this letter seem additionally odd because instead of talking about her own view of causation, she discusses Hobbes's claim that accidents (which she claims are just ways matter moves) are generated (a process she believes requires substance transfer) and perish (something that she thinks cannot happen in nature because all motions are repeatable). Cavendish does address the possibility of motion transfer a few pages later. There she argues that if the motion is incorporeal, then it is a mere nothing or a Devil, Angel, or supernatural soul, which she thinks have better things to do. If the motion is corporeal, she argues, the hand would lose strength with every effort because it must lose matter as well. So, there must be an additional sort of causation (1664, 77-79).

[4] According to Hobbes, "That which rests, is understood to rest always, unless some other body is together with it, by which assumption, it is not able to rest any longer" (OL I.102). Hobbes argues in the continuation of this passage that without a sufficient cause to move in any particular direction a body will remain at rest. But he does not explain how it is that a body can cause another body that is at rest to generate motion.

[5] I would like to thank Marcus Adams for bringing this to my attention.

[6] Note that O'Neill calls them "principal causes," even though she is referring to Hobbes's account of entire causes.

> supposed to be present, it cannot be understood but that the effect is produced at the same instant. (EW I.121–22).

Here, we have Hobbes's account of entire cause, which includes all the properties of both the external object and the perceiver. Cavendish, of course rejects Hobbes's account of the perceiver as a patient, as well as his view that perception occurs as a result of mechanical pressure relayed to the senses by movements from the external object. However, Cavendish does agree that causation occurs as a result of motions in both bodies. But since Cavendish holds that every body has its own self-motion, she denies that any bodies are merely passive or that all perception is caused by pressure or contact. As Adams notes both he, O'Neill, and Michaelian subscribe to Cavendish's acceptance of this account of causes. And they all rightly note that Cavendish takes the fact that causes must be necessary and sufficient for their effects to show that external bodies cannot be the entire cause of a perception. Adams writes,

> With this understanding of *causa integra*, for Cavendish the internal self-motions of patterning and figuring are both necessary and sufficient causes for human visual perception or for self-motions that are indistinguishable from human visual perception, like dreaming. Another way of putting this point is that since causes are always necessary for their effects on the *causa integra* view, external bodies cannot be the cause of patterning since patterning can occur without any such external objects being present. (Adams 2016, 196)

I too agree that Cavendish subscribes to the Hobbesian account of entire causes, but there are two important modifications I want to add to this general account. First, while it is true that Cavendish does not think that the external object is the entire cause of perception, she does think that it plays an important role in perception. Consider the following:

> The Sensitive motion and matter in the Ears receives Words or Sounds, as the Sensitive matter and motion in the Eye doth receive Objects, *for the Motion of the Objects are not the only Cause* of Hearing or Seeing, or the Effects of the other Senses, but the Motions in the Senses make such Motions as the Objects (1663, 299; emphasis added).[7]

Here, Cavendish tells us that the motions of outward objects are *not the only cause* of perception, and she means that they are a cause in conjuction with the self-motion of the perceiver. But what exactly do external objects do that distinguishes Cavendish's occasional causation from full occasionalism? One obvious answer is that they are causes in virtue of their power of self-motion. According to Cavendish, individual bodies are not causally inert so that some other entity—God, for instance—needs to be the sole cause of motion.[8] So, Cavendish is not a full

[7] Compare to *Philosophical Letters*: "But yet I do not say, that the motion of the hand doth not contribute to the motion of the bowl; for though the bowl hath its own natural motion in itself, …nevertheless the motion of the bowl would not move by such an exterior local motion, did not the motion of the hand, or any other exterior moving body give it occasion to move that way; *Wherefore the motion of the hand may very well be said to be the cause of that exterior local motion of the bowl*, but not to be the same motion by which the bowl moves" (1664, 447-448; emphasis added).

[8] Occasional causation, as defined by Steven Nadler (1994: 39) "denotes the entire process whereby one thing, A, occasions or elicits another thing, B, to cause e. Even though it is B that A occasions or incites to engage in the activity of efficient causation in producing e, the relation of occasional causation links A not just to B, but also (and

occasionalist. But then one might worry that Cavendish's view is closer to Leibniz's Pre-established Harmony where the individuals are all self-moving but have no real external relations between them.[9] However, I do not think this is true. In order to see why we first have to understand that for Cavendish the entire cause is not just the sentient, or in the case of perception, the perceiver. Rather, like Hobbes, Cavendish holds that the entire cause involves both the bodies.[10] In addition to the passage cited above, evidence for this view is that Cavendish believes that in cases of perception whenever we are presented with external objects and our senses are working properly, we pattern those object *as they are*.

> But I will conclude this Chapter of Colours with an Answer to Two Questions, the First is, Whether all Creatures see all Objects alike? My Answer is, that if the Sight be Perfect, and without Imperfection, they do, but if the Sight be Imperfect, either by Nature or Accident, or be Over-powered, they do not… but Particulars are no Objection against the General, for surely an Eye is Nature's Press, to Print all Outward Objects that are Presented to it, the like are all the rest of the Senses (1663, 217-218).
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> It is the perceptive motions of the eye, which pattern out an object as it is visibly presented to the corporeal motions in the eye; for according as the object is presented, the pattern is made, if the motions be regular. (1664, 510-511)
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> So soon as the object is removed, the sensitive perception is altered. (2001, 33)
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> For the effects flow from the cause; and as the cause is, so are its effects (1664, 197; see also 1664, 269).

In these and many other passages, Cavendish seems to hold that our sense organs insofar as they are working normally produce adequate copies of exterior objects. She does spend some time discussing how this otherwise reliable system can make mistakes and errors, but she notes these particular issues do not violate the general rule that our senses are such that they pattern external objects "as they are." When my eyes are open and functioning properly (as human eyes) I cannot help but pattern the objects in my visual array, and the same goes for my other sense organs. If the objects are removed or change, so does my perception of them. This shows the dependence of my perceptions on the actual objects presented. However, one might worry that cases of optical illusion might undermine this claim. Kirk Michaelian has argued that Cavendish holds that illusions are due to mistakes in the senses.[11] He claims that this occurs when "the sensitive motions in the perceiving thing, although 'regular', make an incomplete copy of the figurative motions of the perceived thing" (2009, 43). He quotes the following passage from Cavendish as an example:

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especially) to the effect, e, produced by B." This is in contrast to Occasionalism of the sort attributed to Malebranche.

[9] For the account of Leibniz's Pre-established harmony see (Leibniz 1997).

[10] I will focus on cases of perception which is an instance of occasional causation since she discusses these cases more frequently than non-perceptual causal relations.

[11] For further discussions of perceptual errors in Cavendish, see Boyle (2019, 241) and Adams (2016, 200).

> According as the object is presented, the pattern is made, if the motions be regular; for example, a fired end of a stick, if you move it in a circular figure, the sensitive corporeal motions in the eye pattern out the figure of fire, together with the exterior or circular motion, and apprehend it as a fiery circle . . . ; so that the sensitive pattern is made according to the exterior corporeal figurative motion of the object, and not according to its interior figure or motions (Michaelian 2009 43; Cavendish 1664, 511).

Michaelian claims the fiery circle is an optical illusion, and he writes that "in this case, the exterior motions of the object are patterned out but its interior motions are not, giving rise to an inaccurate (because incomplete) copy" (2009, 44). The quotation he presents might lead one to think that the perception of the circular figure of fire is incomplete because the interior figure or motions of the stick are not patterned. If Michaelian believes perceptions are incomplete due to a lack of patterning of interior natures, then he is mistaken. For Cavendish is clear that we never perceive or pattern the interior natures of things, as to pattern the interior nature of something is to become that thing.[12] Cavendish writes

> Nor can I believe, that the exterior parts of objects are able to inform us of all their interior motions; for our human optic sense looks no further than the exterior and superficial parts of solid or dense bodies, and all creatures have several corporeal figurative motions one within another, which cannot be perceived neither by our exterior senses, nor by their exterior motions: as for example, our optic sense can perceive and see through a transparent body; but yet it cannot perceive what that transparent body's figurative motions are, or what is the true cause of its transparentness (2001, 59).

Michaelian points out that patterning cannot entail that something becomes the thing patterned according to Cavendish. He writes,

> Although patterning out is a sort of copying, it is an imperfect copying: when the figurative motions of a thing pattern out those of another thing, the former does not come to instantiate the very same figure as the latter, any more 'than when a painter draws a fire or light, the copy should be a natural fire or light'; there is always a difference between the copy and the original of which it is a copy [2001, 187]. This allows Cavendish to account for the possibility of multiple, distinct perceptions of the same thing (1664, 74), and, more importantly, to avoid saying that perceiving a thing is a matter of coming to resemble it. (Michaelian 2009, 39-40)

So, these perceptions are not incomplete because they do not include perceptions of the interior natures of things. In truth it seems that Cavendish is not all that concerned with optical illusions

[12] Cavendish holds that every object has exterior and interior figure and motions. The interior figures and motions make a thing what it is. "And it is to be observed, that in composed figures, there are interior and exterior parts; the exterior are those which may be perceived by our exterior senses, with all their proprieties, as, colour, magnitude, softness, hardness, thickness, thinness, gravity, levity, etc. *But the interior parts are the interior, natural, figurative motions, which cause it to be such or such a part or creature*: As for example, man has both his interior and exterior parts, as is evident; and each of them has not only their outward figure or shape, *but also their interior, natural, figurative motions, which did not only cause them to be such or such parts; (as for example, a leg, a head, a heart, a spleen, a liver, blood, etc.) but do also continue their being*" (2001, 162; emphasis added).

as the term "illusion" does not appear in her philosophical essays. Rather, she seems to think that the fiery circle is a true perception of the phenomena and is not a mistake. However, Cavendish does cite two examples that do seem to be illusions – the case of a person on a moving ship who believes it is the shore moving rather than the ship, and a person looking in a mirror while walking backwards from it who believes the image in the mirror is going further inward. These cases Cavendish says are "neither perfect mistakes, nor delusions, but onely want of a clear and thorow perception" (1664, 510). The problem, as she sees it, is not that we do not pattern the interior of objects, but rather due to the limitations of human sight, we cannot pattern the motions of the distance or medium between us and a perceived object.

> The cause of it is, That the perception in the eye perceives the distanced body, but not the motion of the distance or medium; for though the man may partly see the motion of the visible parts, yet he doth not see the parts or motion of the distance or medium, which is invisible, and not subject to the perception of sight; and since a pattern cannot be made if the object be not visible, hence I conclude, that the motion of the medium cannot make perception, but that it is the perceptive motions of the eye, which pattern out an object as it is visibly presented to the corporeal motions in the eye; for according as the object is presented, the pattern is made, if the motions be regular (1664, 510-511).

Illusions are due to a lack of patterning of the subtle matter of air, light, or reflective mediums, according to Cavendish. But since illusions result from not patterning those objects imperceptible to human sight, we cannot say that they provide evidence for the claim that exterior objects are neither necessary nor sufficient for perception. We can only perceive the perceivable objects and no account of perception should say otherwise. So, now we must turn to the cases that are more often cited as proving that external objects are not necessary of sufficient for perception – dreaming and being pinched without noticing it.

External Objects as Necessary and Sufficient for Proper Perception

Due to the case of dreaming, Adams claims that Cavendish holds that "external bodies cannot be the cause of patterning since patterning can occur without any such external objects being present," (Adams 2016, 196). In addition, Karen Detlefsen has claimed that "the constraint exercised [by the occasional cause] is neither necessary nor sufficient for the action to occur" (Detlefsen 2006, 234). O'Neill also claims that the cases of dreaming or distraction indicate that the external object is neither necessary nor sufficient for perception (2001, xxxiii). However, once we dig a bit deeper into Cavendish's account we will see that these cases do not justify these claims.

In the case of dreams, Cavendish tells us that the rational parts move *by rote*, that is, they move by a pattern (or at least by a very similar pattern to one) that they have made before. Like memory, the motions of dreams require prior experience of the object. So, the object need not be present when we remember or dream about it, but we cannot produce a thought of an object without having patterned it, or something like it, before. Cavendish calls these motions "figuring" motions rather than patterning. She writes,

> Working by rote, and by Sensible remembrance, they Work falsly, which causes the Rational motions to move Erroneously in Sleep, by reason the Rational moves according, for the most part, to the Sensitive Prints or Pictures; but sometimes the Sensitive, and so the Rational, moves just to those Objects, that have been formerly Printed on the Outside of the Sensitive passages, and then those Sensitive motions cause Perfect Dreams (1663, 283).
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> But Dreaming is, when they move in Figures, making such Figures, as these Objects, which have been Presented to them by the Sensitive motions, which are only Pictures or Copies of the Original Objects, which we call Remembrance, for Remembrance is nothing but a Waking Dream, and a Dream is nothing but a Sleeping Remembrance (1663, 286).
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> But Dreams, according to my opinion, are made by the Sensitive and Rational Corporeal Motions, by figuring several objects, as awake; onely the difference is, that the Sensitive motions in Dreams work by rote and on the inside of the Sensitive organs, when as awake they work according to the patterns of outward objects, and exteriously or on the outside of the sensitive Organs, so that sleep or dreams are nothing else but an alteration of motions, from moving exteriously to move interiously, and from working after a Pattern to work by rote (1664, 28-29).
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> When outward objects present themselves to the optic sense to be perceived, the perception of the sentient is an occasioned perception; but *whensoever, either in dreams, or in distempers, the sensitive motions of the same organ, make such or such figures, without any presentation of exterior objects, then that action cannot properly be called an exterior perception*; but it is a voluntary action of the sensitive motions in the organ of sight, not made after an outward pattern, but by rote, and of their own accord. (2001, 20; emphasis added)
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> But it is well to be observed, that, besides those exterior perceptions of objects, there are some other interior actions both of sense and reason, which are made without the presentation of exterior objects, voluntarily, or by rote; *and therefore are not actions of patterning, but voluntary actions of figuring*: …And therefore it is well to be observed, that figuring and patterning are not one and the same; figuring is a general action of nature: for, all corporeal actions are figurative, whenas patterning is but a particular sort of figuring (2001, 170; emphasis added).
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> For though the Animate motions oftentimes move and work as Actively to Sleep, and in Sleep, yet it is easier to move Voluntarily, than when they are Bound to Outward objects, as to Work upon Constraint and Necessity. (PPO 1663, VI.XIX, 280)

As Michaelian notes, "Dreaming, for example, will not count as perception" because dreaming is not patterning, but rather one of the motions made by rote (Michaelian 41). So, the fact that we can have a figurative motion that creates images in our sleep without external objects does not mean that perception properly so called can happen without exterior objects. Thus, the claims

that dreaming show that exterior objects are not causally necessary for proper perception are false.

The claim that exterior objects are not sufficient for perception are largely based on passages where Cavendish claims that a person can be pinched, but not notice it. She explains the case as follows:

> Suppose a man be in a deep contemplative study, and somebody touch or pinch him, it happens oft that he takes no notice at all of it, nor doth feel it; whenas yet his touched or pinched parts are sensible, or have a sensitive perception thereof; also a man doth often see or hear something, without minding or taking notice thereof, especially when his thoughts are busily employed about some other things; which proves, that his mind, or rational motions, work quite to another perception than his sensitive do (2001, 150; cf. 1663, 293)

However, in the case of the pinch that goes unnoticed, Cavendish thinks that the sensitive matter does pattern the pinch, so patterning does occur. It is simply the case that the rational matter is so preoccupied that the sensitive patterning went unacknowledged (the double-perception that normally occurs fails in this case). This is similar to cases when one has been driving for a while and realizes that they have not been paying attention. The driving was still happening – the eyes were looking at the road, the foot was pressing the gas – but the mind was elsewhere. As Cavendish concludes:

> …[t]herefore it may very well be, that a man in a deep contemplative study, doth not always feel when he is pinched or touched; because all the rational motions of his body concur or join to the conception of his musing thoughts; so that only the sensitive motions in that part, do work to the perception of touch; whenas the rational, even of the same part, may work to the conception of his thoughts (2001, 152).

These cases only show that the mind can be so pre-occupied that we do not notice our sensations. They do not show that "The principal cause acts entirely on its own" without exterior objects (Detlefsen 2006, 234). Rather, in the case of the pinch, the object does cause the appropriate perception in the sensitive matter, but the rational matter fails to pattern the sensitive perception as it normally does. These often-cited cases do not prove that the external object is neither necessary nor sufficient for perception. Of course, it is true that actions made by rote in memory, dreams, or delusions, do not require the external object's presence, but since these are cases of figuring rather than patterning—that is they are not cases of proper perception at all—the claim that external objects constitute part of the entire cause of perception stands.

But there is a further advantage to interpreting Cavendish's account this way. The cases of delusion and dreaming can help us to understand the causal role of the occasional cause. In the case of dreaming, as noted above Cavendish tells us that the external sensory organs of the perceiver do not pattern an external object; rather they move by 'rote' or memory (actions she associates with voluntary motions). In dreams, as the quotes above indicate, motions begin in the interior parts of the body and are figured on the inside of the sensory organs, while in cases of

proper perception the motions begin on the outside of our sensory organs and moving inwards to the nerves and brain. Cavendish writes:

> …yet the sensitive corporeal motions having their proper organs, as Work-houses, in which they work some sorts of perceptions, those perceptions are most commonly made in those organs, and are double again; *for the sensitive motions work either on the inside or on the outside of those organs, on the inside in Dreams, on the out-side awake*… (1664, 19; emphasis added; see also 1668, 20).

> The Difference between Sleeping and Waking, is, that in Sleep the Sensitive Animate matter and motions Work on the Inside of the Sensitive passages, as they do when as Awake on the Outside of the Sensitive passages, and when as the Sensitive motions Work on the Inside of the Sensitive passages, they Work by Rote, that is, they Work as to make Prints and Figures on the Inside of the Sensitive passages, without the Help or Patterns of Outward objects (1663, 282).

Cavendish's accounts of dreaming are usually given in contrast to cases of proper perception, in which the exterior object is the occasion of the patterning of the exterior parts of our sensory organs, which information is then relayed inward to the brain.[13] Thus, we can conclude that in cases of proper perception the existence of the exterior occasional cause determines the *direction* of the causal process from exterior to interior. Without the occasional cause, the figurative motions, if any, would move in a different direction—from the brain to the inside of the sense organs. In this way, we can claim that *the occasional cause does do something*. It does affect the perceiver as it brings about a direction of causality within the perceiver that would not occur if it were absent. If the external object does determine the direction of causation, it would seem that the individual is not completely self-determining with respect to their perceptions. Although it is still true that the perceptive motions in the perceiver's sensory organs and mind are self-motions, these motions are affected by the presence or absence of the exterior object. Moreover, this explains why Cavendish calls occasioned action, "necessary" or "forced." For example, she writes, "that exterior body is the occasion that it moves after such a manner or way, and therefore this motion of the line, although it is the lines own motion, yet in respect of the exterior body that causes it to move that way, it may be called a forced, or rather an occasioned motion" (1664, 443). In addition, in her criticism of Hobbes's account of voluntary motions, she writes, "they cannot properly be called voluntary, but are rather necessitated, at least occasioned by the Mind or Fancy; for I oppose voluntary actions to those that are occasioned or forced" (1666, 55). I will return to this issue below.

[13] Consider a passage that may cast doubt on this reading: "It is true, by Experience we find, that without an Eye we cannot see Outward objects as they are without us, yet we see those Objects as they are without us in our Sleep, when our Eyes be shut: Thus the Sense of Seeing is not lost, although the Eyes were out, and the Optick Nerves stop'd up" (1663, 294–95). The context of this passage is Cavendish's objection to the idea that all figures in the mind come in through the eyes. Cavendish argues in the quote above that (1) we "see" figures in our minds when we dream, but when we dream our eyes are closed and our optic nerve is "stop'd up. She goes on to argue that (2) the motions of the brain are motions of rational matter and those motions are always figurative whether it is thinking, imagining, dreaming, or receiving non-optical sensory information (1663, 259-299).

I have here argued that, for Cavendish, the external object is an occasion for the perceiver to pattern via its own power of self-motion the external object, but in addition I have argued that this occasional cause is part of the entire cause in cases of proper perception. The external object contributes in two ways: first, the external object's proprieties (Cavendish's term) determine the content of the perception of the perceiver when the perceiver's organs are in normal working order; second, the external object determines the direction of causation within the perceiver. Without the external object, the sensitive and rational matter may move figuratively to create dreams, imaginings, or fancies, but these are not cases of proper perception. In addition, in cases of dreaming, the figuring is done on the inside of the sensory organs rather than on the outside.

The picture painted so far looks to be in keeping with Hobbes's causally deterministic view of the world. But we might still claim that because perceivers have self-motion, they are still self-determining and so Cavendish's system allows for non-deterministic processes in a way that Hobbes's account does not. Next, I will consider Karen Detlefsen's argument that individuals are not subject to any sort of causal determinism.

Nature as the Principle Cause

As we have seen, for Cavendish, perception involves occasional causation, which Cavendish calls patterning. The ball patterns the motions of the hand and moves itself in accordance with this perception, and the seemingly conclusive cases of dreams and delusions (which I have argued against) provide reason for Detlefsen to think that the "principal cause" (in this case the ball) is completely free. Detlefsen argues there are three reasons for believing that occasional causation supports libertarian freedom. She writes:

> Principal causes that are encouraged to act in a specific way by occasional causes are free, of course, for the following reasons: the constraint exercised is neither necessary nor sufficient for the action to occur; the principal cause is self-moved; and the principal cause acts in accordance with its own reasons. But the occasional cause exercises some constraining influence—a moral influence—over the actions of the principal cause(Detlefsen 2006, 234).[14]

So, the principal cause must be radically free because the occasional cause is neither necessary nor sufficient for the action of the principal cause, the principal cause moves itself, and the principal cause acts by its own reasons. I have already shown that the occasional cause is necessary and, when acting as part of the entire cause, sufficient for cases of proper perception. But Detlefsen claims in several places that self-motion and reason are sufficient for libertarian freedom. However, it seems that this is not so. Having the power to move oneself and the power of reason are compatible with determinism. After all, there are many compatibilist accounts that hold that we are self-moving and (at least somewhat) reasonable – Locke's, Leibniz's, etc.[15] In addition, I nowhere find Cavendish discussing a part moving "in accordance with its own reasons." Nevertheless, we should still examine the parts of Detlefsen's argument that do not depend just on occasional causation. In a passage claiming the parts of nature are not

[14] O'Neill also claims that the exterior object is merely a moral cause (2001, xxx-xxxiii).
[15] Boyle (2018 and 2019) follows Detlefsen on these points.

necessitated, she implies that if nature were a principle cause and the parts of nature "mere effects" necessitation would hold. She writes,

> The theory of occasional causation supports a view of nature in which natural parts themselves act as principal causes and are not necessitated to behave in a certain way. They are necessitated neither by nature as a whole imposing, from the top down, specific interrelations among the parts (which then become mere effects and not causes at all), nor by occasional causes necessitating that the principal cause act in a specific fashion. That is, they are free from extrinsic control. (Detlefsen 2006, 234)

Cavendish seems to use the language of principal causes and prime causes interchangeably, and she is pretty clear about what counts as a prime or principal cause.

> But there is but one onely chief and prime cause from which all effects and varieties proceed, which cause is corporeal Nature, or natural self-moving Matter, which forms and produces all natural things (1664, 237).

> Matter is the prime cause of Figure, but not Figure of Matter, for Figure doth not make Matter, but Matter Figure, no more than the Creature can make the Creator, but a Creature may make a Figure (1663, 93).[16]

> But, to conclude, human sense and reason perceiveth, that from Few, indeed, but from One Principle, (as the Only matter) Infinite Effects do proceed (1663, 8).

> But, in my opinion, Water, and the rest of the Elements, are but effects of Nature, as other Creatures are, and so cannot be prime causes (1664, 234).

According to Cavendish, the prime cause is matter, which is all of nature. She is also pretty clear about what the effects of matter are – everything in nature. She notes that these effects, however, are also causes.

> There are Infinite effects and every produced effect, is a Producing effect, which Effect produces Effects, and the only matter is the cause of all Effects…. (1663, 100).

> To treat of Infinite Effects, produced from an Infinite Cause, is an endless Work, and impossible to be performed, or effected; only this may be said, That the Effects, though Infinite, are so united to the material Cause, as that not any single effect can be, nor no Effect can be annihilated; by reason all Effects are in the power of the Cause. But this is to be noted, That some Effects producing other Effects, are, in some sort or manner, a Cause (1996, 15).

[16] Note this interesting exception to the rule: "Was not God able to give self-motion as well to a Material, as to an Immaterial Creature, and endow Matter with a self-moving power? I do not say, Madam, that Matter hath motion of it self, so, that it is the prime cause and principle of its own self-motion; for that were to make Matter a God, which I am far from believing; but my opinion is, That the self-motion of Matter proceeds from God, as well as the self-motion of an Immaterial Spirit; and that I am of this opinion, the last Chapter of my Book of Philosophy will enform you, where I treat of the Deitical Centre, as the Fountain from whence all things do flow, and which is the supream Cause, Author, Ruler and Governor of all" (1664, 179).

Detlefsen claims that we must choose whether we want to say that Nature is the principal cause and that all causation is "top-down" or whether individuals are the real principal causes. She goes for the latter claim saying that "we need to deny that nature is principal cause in a natural, physical sense" in order to hold that individuals are principal causes (2006, 236). Instead of holding that nature is a principal physical cause, Detlefsen argues that Cavendish must hold that nature is merely a moral cause.[17] Detlefsen acknowledges that this goes well beyond the text. There is nowhere in Cavendish's corpus where she speaks of moral causes. But, as noted above, there are places where Cavendish calls nature the prime and principal cause. In addition to claiming that nature or only matter is the prime cause of all her effects, Cavendish also claims that all these effects constitute the body of nature.

> …for my opinion is, that they are all but one matter, and *one material body of nature*. And this is the difference between the cause or principle, and the effects of nature, from the neglect of which, comes the mistake of so many authors, to wit, that they ascribe to the effects what properly belongs to the cause, making those figures which are composed of the aforesaid animate and inanimate parts of matter, and are no more but effects, the principles of all other creatures (2001, 206; emphasis added).

> …there is infinite nature, which may be called general nature, or nature in general, which includes and comprehends all the effects and creatures that lie within her, and belong to her, as being *parts of her own self-moving body* (2001, 197; emphasis added).

Detlefsen says that she takes Cavendish's claim that nature is one body seriously, but she seems to think that it implies top-down causation. However, I think that this is not the case. It is obvious that living bodies do not operate in a completely top-down manner. Rather, there is some degree of top-down causation, but there is also bottom up causation, and lateral causation within the systems and structures of the body. Cavendish holds that there are bodies within bodies in nature, and each of these bodies have their own particular figurative motions that form causal systems that perform the functions of various organs, circulate blood, push oxygen into the lungs, and expel waste through the intestines. The fact that nature works like a body explains why Cavendish's texts sometimes look like she is positing a top-down system and sometimes a bottom-up system – both are included.

This brings us to Cavendish's holism, which is closer to what we might now call biological holism than metaphysical holism. For Cavendish, causal relations happen at every level of the organism (or whole of nature). Just as in a human being there are bodily commands that come from the mind and direct the whole organism in certain ways, as when we might flee a perceived danger, but there are also causal relations that occur within parts of the body as when our heart beats, and across parts as when we digest food. This is not to say that nature is a person or a human, but that nature is a living organism.[18]

So, while contemporary metaphysicians might speak of holism as the view that there are properties of nature that are not the result of the fundamental parts and their relations and that the whole is

[17] Detlefsen's argument follows O'Neill's discussion of occasional causes being principal causes (2001, xxx-xxxiii).
[18] See Anker (2003) for a discussion of how Cavendish holds that Nature is a *human* body.

something over and above the parts, this is not Cavendish's view. Rather, Cavendish's view most closely resembles the sort of holism we see in the living sciences. This, of course, makes sense. According to this sort of holistic view, we cannot fully understand a single organism without reference to the whole system as all the parts of the system are interconnected in such a way that individuals are, in some sense, incomplete when abstracted away from the whole. Cavendish frequently stresses the interdependence of the parts of nature. If nature is the principal cause of all the effects in nature, then we can see that while Cavendish may not be committed to top-down causal laws, she is still committed to the parts of nature being effects in a complex system of causal interrelations.

Determinism?

We may not think that appeals to causation are the correct way to argue about determinism today due to issues about what counts as a cause. However, in the seventeenth century, being committed to causes as necessary and sufficient for their effects was the leading way to argue that the world was deterministic in nature. For instance, Hobbes writes that "An entire cause is always sufficient for the production of its effect, if the effect be at all possible" (EW I.122). And "a necessary cause is defined to be that, which being supposed, the effect cannot but follow" (EW I.123). From these claims he argues that determinism follows. He writes,

> For whatsoever is produced, in as much as it is produced, had an entire cause, that is, had all those things, which being supposed, it cannot be understood but that the effect follows; that is, it had a necessary cause. And in the same manner it may be shewn, that whatsoever effects are hereafter to be produced, shall have a necessary cause; so that all the effects that have been, or shall be produced, have their necessity in things antecedent. (EW I.123)

Cavendish does not argue for determinism, although her account of causation would make Hobbes's argument available to her. Even though she does not argue for determinism, we should not ascribe libertarian free will to her either.[19] Deborah Boyle correctly notes that Cavendish's texts cut both ways with respect to free will. Boyle also notes, I believe correctly, that freedom is not a central theme in Cavendish's writing (2019, 37). I think this is probably good reason not to saddle her with a radical libertarian account that most of her contemporaries did not hold.

It seems likely that Cavendish does not develop an account of freedom because she does not take it to be an important part of natural philosophy. This would be a more radical line of what should be included in the study of bodies than Hobbes takes. Hobbes claims that natural philosophy excludes theology (the study of the nature of God), the study of spirits and immaterial entities, divine revelation, and issues of worship and faith (EW I.10-11). However, Cavendish seems to think that the question of whether we have free will or not is one that is more suited for theologians and moral philosophers. Writing in response to Hobbes's claims about voluntary motions that Hobbes "is much for necessitation, and against free-will, which I leave to Moral Philosophers and Divines" (1664, 96) Cavendish does write about moral and political issues as

[19] Cunning (2016, 214) argues that libertarian freedom does not follow from Cavendish's use of free will and freedom in her works. Cunning argues that Cavendish's commitment to the plenum means that parts of nature will not always be allowed to move as they will. Thus, he assigns a compatibilist account of freedom to Cavendish.

well as the occasional references to religion and God's nature (as does Hobbes), but her most robust discussions of moral and political issues are kept separate from her works on natural philosophy. It is still worthwhile to examine briefly what she says in response to Hobbes regarding voluntary motions and freedom since her acceptance of his views on causation make it more likely that she would also hold something similar to his views on determinism and freedom.

In his discussion of gravity, Hobbes claims that inanimate bodies cannot move themselves to a place because they "have no appetite at all," and so it is "ridiculous to think that by their own innate appetite they should preserve themselves, not understanding what preserves them" (EW I.510). He goes on to claim that even humans "who have both appetite and understanding" cannot leap more than three or four feet above the ground to save their own lives (EW I.510). Cavendish responds to this passage in her *Philosophical Letters* by arguing that if God gave humans who are just parts of nature a "power and free will of moving himself, why should God not give it to Nature?" (1664, 95). She continues

> I do not say, That man hath an absolute Free-will, or power to move, according to his desire; for it is not conceived, that a part can have an absolute power: nevertheless his motion both of body and mind is a free and self-motion, and such a self-motion hath every thing in Nature according to its figure or shape…Yet do I not say, That there is no hindrance, obstruction and opposition in nature; but as there is no particular Creature, that hath an absolute power of self-moving; so that Creature which hath the advantage of strength, subtilty, or policy, shape, or figure, and the like, may oppose and over-power another which is inferior to it, in all this; yet this hinderance and opposition doth not take away self-motion (1664, 95-96).

Here, Cavendish seems to claim that self-motions are free. Of course, what matters is how she understands the term 'free'. It seems that she thinks that one is free if one is able to move as one desires and that this holds for every part of nature.[20] But bodies are sometimes necessitated by exterior objects. These objects can necessitate responses from other objects through either occasional causation or substance transfer. When this occurs, the action is not voluntary or free. Cavendish criticizes Hobbes's account of voluntary actions because they are "caused and depend upon our Imagination," and she wonders "how can they be voluntary motions, being in a manner forced and necessitated to move according to Fancy or Imagination?" (1664, 96). In a section explaining "obscure and doubtful passages" in her prior works, which is appended to the end of the 1666 edition of *Observations Upon Experimental Philosophy*, she clarifies her criticism writing

> When, contradicting the opinion of Mr. Hobbes concerning voluntary motions…My meaning is not as if those actions were not self-actions, nor as if there were no voluntary

[20] Cavendish will often say that Nature as a whole is free because she is always able to move as she pleases. For example, "although nature is free, and all her parts self-moving; yet not every part is free to move as it pleases" (OEP, 244), and "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" (2001, 138-139).

> actions at all; for to make a balance between Natures actions, there are voluntary, as well as occasioned actions, both in sense and reason; but because Mr Hobbs says, that those actions are depending upon Imagination and Fancy, and that Imagination is the first internal beginning of them, which sets them a going, as the prime wheel of a Watch does the rest: My opinion is, that after this rate they cannot properly be called voluntary, but are rather necessitated, at least occasioned by the Mind or Fancy; for I oppose voluntary actions to those that are occasioned or forced; which voluntary actions are made by the self-moving parts by rote, and of their own accord; but occasioned actions are made by imitation, although they are all self-actions, that is, move by their own inherent self-motion (1666, 54-55)

According to Cavendish, occasioned actions are not voluntary or free because they involve an exterior cause. Only actions that have their origin in the desire or will of the individual – those actions done by rote – will count as voluntary or free, and these in a compatibilist sense. It is also interesting that sometimes when Cavendish talks about the movements of the parts of nature, she uses Hobbes's phrase, which she quotes from *Leviathan* above – 'knowing what they do, or why and whither they move' (1668, 139, 207, 258; and 1666, 308). The echoing of this language is surely intentional on Cavendish's part and belies an affinity with Hobbes's account of liberty – according to which one is at liberty if one is able to move as one desires, rather than will as one pleases. While we cannot say that Cavendish argues for determinism or a compatibilist account of freedom, it does seem that her views on causation lead one to believe that she held such a view.

Conclusion

I have argued that Cavendish's system is more deterministic and closer to that of Hobbes than other commentators have thought. In doing so, I have argued that her account of perception does not entail that perceivers are the entire cause of their perceptions and that Cavendish thought that matter was the only prime and principal cause in nature. This interpretation is more naturalistic than others on offer and eschews any teleological or normative structure in Cavendish's system of nature. This, I take to be more in keeping with her aims of constructing a natural philosophy that adequately accounts for the movements of the organic bodies in nature.

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